

Champions of motorcycling

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The Premià de Mar Museum of Printing is hosting the temporary exhibition CHAMPIONS OF MOTORCYCLING, from 10 March to 31 December

The idea of the exhibition is to show that behind the world of high risk motorsports there is an army of designers, textile engineers and assistants who play a crucial role in providing equipment and apparel for the professional riders. Their creations must be up-to-date and stylish, reflecting the fashion trends of the moment, but must also be fully functional in terms of comfort, flexibility, freedom of movement, protection and safety. And of course the sponsors' brand names and logos printed on the riders' clothing must be clearly visible.

The exhibition covers various forms of off-road and circuit motorcycle racing, and celebrates the achievements of the champions from the world of Trial, Motocross, Enduro, and Rally Raids. It also includes the media favourite Moto GP on a trip through history featuring riders from Catalonia and elsewhere.

The exhibition begins with Trial, an off-road discipline, in which riders overcome a series of obstacles without allowing their body to touch the ground. Trial was invented in the UK in the early twentieth century: in 1909 of the Scottish Six Days Trial was held for the first time, which combined competitions of speed and skill. The first indoor trial was held in Barcelona in 1978, and today this discipline is extremely popular in Catalonia and the UK.

The Trial rider's equipment consists basically of helmet, gloves, boots and trousers or suit. The one piece suit has to combine protection with elasticity and lightness, which are vital to achieving success in this discipline.

The elasticity is provided by the fabric: most suits are made of spandex, a synthetic fibre that can stretch up to 600% without breaking and always returns to its original shape. It is a very long chain polymer composed of at least 85% of segmented polyurethane. It was invented in 1959 by the chemist Joseph Shivers and marketed by DuPont. The best known brand name is Lycra®, now the property of INVISTA.

Kevlar® (poly-paraphenylene terephthalamide) is a fibre that provides safety and protection. Kevlar® is characterized by its toughness, its mechanical



Panoramic view of the exhibition showing the route marked out by the tread of a tyre, which links together the different displays.

resistance and its tolerance of high temperatures. It is a polyamide with a very rigid molecular structure. It was first synthesized by the chemist Stephanie Kwolek in 1965 while working for DuPont.

These fabrics can be printed using what is called the transfer system. First, the design is printed on paper with a digital printer, and transferred to fabric using sublimation printing. The machine applies high temperatures to the ink which passes from solid state into gas and then vice versa. The ink becomes volatile and thus attaches to the fabric.

The Trial suit and the other garments are ideal for carrying the sponsors' brand names and advertising slogans. Marketing and communications professionals study the movements made by the riders to position logos and other printed designs on the most exposed areas. The point is to ensure the highest possible exposure visibility in competitions and in the media; situating them strategically is essential in order to maximize their impact.

Jordi Tarrés was the first Catalan rider to attract large numbers of sponsors and effectively established Trial as a professional sport. Tarrés's suit is on display, along with a tribute to his professional achievements listed by seasons and championships. The other riders represented are Marc Colomer, Adam Raga, Laia Sanz, Takashi Fujinami, and the current indoor and outdoor world champion, Toni Bou.

The exhibition continues with Enduro and Motocross. Enduro is another off-road discipline in which riders must cover a set itinerary through all types of terrain inside a time limit. The stages are strictly controlled, and riders must

Trial: in the foreground, Jordi Tarrés (Gas Gas team, 1980s-1990s), the first rider to carry sponsorship printed on his clothing, in the background The suit worn by Marc Colomer (Montesa Team, 1985-2004), and a list of his titles, and the trousers worn by Takashi Fujinami, Repsol-Montesa HRC (2010).



Suit, photos and list of awards won by the Trial world champion Toni Bou, Repsol Montesa HRC team (2012-13). [See more.](#)



Suit worn by Narcis Casas (Enduro), consisting of helmet, jersey and trousers (1972).



stamp their cards at a specific time; they are penalized if they arrive either early or late. It may also include complementary tests that count towards the overall result, including a timed section and an acceleration test on asphalt, among others. In Motocross, also off-road, riders race each other in a circuit in open terrain with natural obstacles.

The exhibition continues with Rally Raid (also known as Cross Country Rallying). This is another off-road discipline for motorcycles (also for cars), a long distance race on all types of terrain which tests participants' resistance. It usually lasts between 3 to 15 days, and distances of up to 900 km per day may be covered. The best known are the Dakar Rally, the Rally of the Pharaohs, the Rally dos Sertões, the Central Europe Rally, the Baja Aragón, the Himalayas Raid and the Northern Forest race in Russia.

The equipment required by riders in these three disciplines is very similar. It consists basically of a helmet, boots, gloves, and the shirt and trousers. Riders also wear protection in the form of knee pads, elbow pads, and safety jackets with chest and back protectors.

The first trousers were made of leather, which were generally safe but quite rigid. Technological developments have made it possible to replace leather with a combination of high strength fabrics. Cordura 500D fabrics can be sewn with reinforced parts such as Kevlar and leather to increase the resistance.

Rally Raid suit worn by Juan Pedrero, consisting of glasses, boots, shirt and trousers. KTM Team (2012). [See details.](#)



A predetermined shape can also be given to the trousers to ensure greater comfort, complementing it with stretch fabric in the areas requiring maximum protection.

The exhibition presents examples of leather suits like the one worn by Narcís Casas and shows the evolution of the design in the shape of the suit worn by Francesc Rubio, and then a present-day specimen made of Cordura, worn by the Enduro rider Iván Cervantes.

Resistance is a key factor in motorcycle suits. CORDURA® fabric, patented by DuPont in 1929, offers excellent resistance. This is a polyamide made of densely woven nylon threads and is resistant to scratches, abrasion and perforation.

Unlike Trial, protection in Enduro and Motocross is provided by removable plastic parts. The materials used are EVA (ethylene vinyl acetate) and TPR (Thermoplastic Rubber) placed in strategic areas to soften blows or falls. In the study of the development and positioning of the piece of rubber, innovation and technology play a key part. Protectors are attached to the base fabrics through heat fusion techniques.

As for the printing, the designs and logos are printed on paper and then transferred to the fabric using the sublimation technique, as described above. All the base fabrics used in suits for Enduro, Motocross and Raid allow printing; in fact, even boots and TPR can be printed with thermal and high frequency screen printing techniques.

Motorcycle belonging to the Enduro champion Narcís Casas (1978). Bultaco, model: Frontera MK11, 370 c.c. Loaned to the museum by Narcís Casas and the Bassella Motorcycle Museum.



The exhibition displays the suits and lists of the titles won by Narcís Casas, Francesc Rubio, Iván Cervantes, Javi García Vico, Rafa García, and the promising youngster, Josep García, for Enduro and Motocross. Raid is represented by Marc Coma, Jordi Viladoms, Gerard Farrés, Joan Pedrero, and by the queen of the desert, Laia Sanz.

The exhibition ends with motorcycle racing. This event comprises short races in a circuit in which riders must complete a certain number of laps in the shortest time possible. There are several categories, such as Moto 2, Moto 3 and Moto GP, and other competitions such as Superbike, Superstock, and Supersport. The MotoGP championship is organized by the FIM (Fédération Internationale de Motocyclisme) and the Spanish company Dorna Sports. In Catalonia, the Montmeló circuit hosts the Aperol Grand Prix of Catalonia.

The riders' **first line of defence** is their clothing. Besides protection, the most valued features of clothing for the Moto GP are aerodynamics, breathability, comfort, durability, flexibility, lightness and resistance to water. The equipment consists of a leather suit (cowhide or kangaroo), gloves, helmets, protective boots and accessories.

Cowhide, the base of the riders' suits, offers a good level of transpiration and guarantees high resistance to abrasion and low water absorption in the case of rain. Normally these suits are around 1.2 mm thick. Thanks to special treatments using resins and the application of natural fats, a soft feel is achieved and the colour fastness is ensured. These full suits have finishes for thermoregulation.

Ergonomics and comfort can be enhanced by inserting elastic fabric in strategic zones. Protection filaments can also be placed over different parts of the body, especially on the flanks, the collarbone, in the chest and kidneys. There are also special inserts made of multilayer structures based on carbon fibre and Kevlar® which ensure maximum protection against blows. In some cases, Airbag systems are built into the riders' suits to ensure their safety and protection.

The Impala 24 h. were extremely popular in Montjuïc in the 1960s*;1 they are considered the forerunner of modern-day speed bikes. In the photo, the Montesa Impala 4M, 175 cc (1962), donated to the Museum by Xavi Arenas of the Motoclub Impala.



MARCA: MONTESA
MODEL: IMPALA 4M
CILINDRADA: 175 cc.
ANY: 1962

El
motociclisme de velocitat,
concretament a l'espècie de curses de circuit,
veu curta durada en que els pilots han de
completar un nombre determinat de voltes en el
menor temps possible.
En les dècades anteriors, com la Moto 2, Moto 3 i la
Moto GP, La Montesa GP és la categoria reina del motociclisme
de velocitat, que substituirà des del 2002 la històrica dels
500cc, amb gran èxit internacional. A més, inclou també
les competicions de Superbike, Superstock, Supersport.
El campionat de Mota GP està organitzat per la FIM
(Federación Internacional de Motociclismo)
i competeix en diferents Grans Premis,
a Catalunya, s'omèn el Circuit de Montmeló
i es disputa el Gran Premi Aeri de
Catalunya.



* MARISTANY, Manolo, Operación Impala, editorial Librería Universitaria, Barcelona, 2011.



This type of suit can also incorporate a drinking device **placed on the back** attached to the helmet. A data collection system incorporating sensors constantly tracks the rider's physical condition. Reflective materials are often added on the elbows and the back to maximize the rider's visibility. The combination of designs and colours identifies the teams and sponsors. Manufacturers of these parts are: Berik, BKS, Alpinestars, Dainese, Puma, Revit, Spidi and Spyke. The display includes the suits of Emilio Alzamora and Toni Elias.

Each area also includes the motorcycles used in the various events, highlighting the chronological evolution of the different models.

A final word of thanks to all the riders who take part in these exciting championships every year, and a special mention for those who have suffered injury in these extremely dangerous sports. We also thank the organizers and contributors who have made this exhibition possible. ●