Content

Season

Preview

Goals and paths

The Sauber F1 Team presented the Sauber C32-Ferrari to its partners and the media on Saturday, 2nd February, as drivers Nico Hülkenberg (DE, 25) and Esteban Gutiérrez (MX, 21) pulled back the covers on the new car at the team's base in Hinwil, Switzerland. The roll-out of the Sauber C32 will take place during the first winter test at Jerez de la Frontera on 5th February.

"Two thousand and twelve was a very successful year for us," said Monisha Kaltenborn, looking ahead to the new season. "We not only moved up from seventh to sixth place in the constructors' standings, but also improved our points total from 44 in 2011 to 126 last season. We have a strong platform in place now, on which we are aiming to build and continue our upward curve."

The Team Principal is bullish about the prospects for the team's new driver pairing: "We have had our eye on Nico Hülkenberg for some time and have been impressed by his performances. He is very quick, but, most importantly, he's also very efficient. He understands how to pick up as many points as possible from a particular race situation. Esteban Gutiérrez is a driver we know very well as a result of a relationship with the team going back several years, and he has already had a number of opportunities to test with our car. Plus, he has always stayed in close contact with our engineers, which has allowed him to learn a lot about Formula One. I'm in no doubt he is now ready to take the final step and put his outstanding talent on display."

Gutiérrez has been succeeded as test and reserve driver by 21-year-old Dutchman Robin Frijns. "We rate him as an extraordinarily gifted young man, so we decided to give him this opportunity," explained Kaltenborn. "We will now set about introducing him step by step to life in Formula One."

Hülkenberg is entering his third F1 season in a race seat. The German spent 2010 – his rookie year – with Williams and 2012 at the wheel of a Force India car. "The Sauber F1 Team made significant progress last year from 2011," the German driver recognised. "Now the team is ready to take the next step, and I want to play my part in making that happen. My personal aim is to put in a good, steady performance this season."

Gutiérrez won the GP3 Championship with something to spare in 2010. He promptly made the move up to GP2 and finished third in last year's standings.

Now the Mexican is focused on the future: “I’m really looking forward to my first season in Formula One. My long association with the Sauber F1 Team has given me the chance to understand the complexity of Formula One. But I also realise, of course, that I still have a huge amount to learn. I will be working flat out to adapt to the whole F1 environment as quickly as possible and, if things open up during races, I want to make sure I’m ready to take full advantage.”

Test and reserve driver Frijns (21) spent last year competing in the Formula World Series by Renault – and crowned his season with the championship title. “I’m overjoyed that the Sauber F1 Team has given me this chance. I will do everything I can to support the team as effectively as possible and, at the same time, learn how things work in the professional world of Formula One,” said the Dutch youngster.

The three drivers and the new Sauber C32-Ferrari are set to make a fine combination.

Sauber C32-Ferrari - Making a good thing even better

The F1 technical regulations have barely changed going into the 2013 season and yet the new Sauber C32-Ferrari is a very different proposition visually from its predecessor – thanks to a smooth, slightly downward-sloping nose section and, principally, much slimmer sidepods.

“The C31 was an extremely competitive car with many strengths,” explained Matt Morris, the Sauber F1 Team’s Chief Designer. Our aim was to further improve these strengths and eliminate its few weaknesses.

“Over the course of last season we invested a lot of time and energy in developing a better understanding of our car. To this end, we focused primarily on the aerodynamic effects around the rear of the car. Our aero experts have done some great work in this respect, the basis of which has been used to develop the C32.”

Radical changes have also been conspicuous by their absence when it comes to tyres. “We had the opportunity to test with the new generation of tyres at the last race of the 2012 season at Interlagos,” said Morris. “Although there are some differences in the construction of the tyres, as a whole the changes are minimal, which means there was no need for a fundamental redevelopment in this area.”

Front end

A year ago almost all the cars on the grid had one particular feature in common: a stepped nose. This design element caused an outcry among many fans, but was rendered nigh-on unavoidable by the regulations. For 2013, the FIA has now allowed a cosmetic fairing to be used in this area, while retaining the current chassis and structural nose height regulations.

The nose now sweeps down smoothly towards the track, which not only improves the car’s looks, but, more significantly, enhances the aerodynamics of the front end.

With the front wing, the aerodynamicists have put their faith in a proven formula, further optimising last year’s development and thus improving its aerodynamic efficiency.

The engineers also remained true to the basic concept of the front suspension, carrying out only minor adjustments.

Central section

The sidepods of the C32 are notably slimmer than the Formula One norm up to now and are responsible for giving the new car a very distinctive look. “The airflow in this area has a major influence over everything that happens at the rear of the car,” said Morris, offering a glimpse into the team’s thinking.

The significantly reduced volume of the sidepods over conventional variants makes packaging a particular challenge. Even the smallest empty space has been used to accommodate the countless components.

An extremely slim rear end was high up the engineers’ list of priorities. One of the key aspects here is the arrangement of the radiators, which is very different from that in the C31. A look at the rear end of the new car reveals the engineers’ rigorous approach to this area.

Morris said: “It is one thing the aerodynamicists coming up with great ideas, but they are often difficult to make into reality. In this respect, the design and production team has done a fantastic job on the side pods, both from a structural and packaging perspective.”

The aerodynamicists have also invested a lot of time developing the details around the exhaust exits – an area which has a major impact on performance and in which the Sauber F1 Team was one of the leading exponents last season.

As before, the car’s KERS (Kinetic Energy Recovery System), engine and gearbox are supplied by Ferrari. The KERS is based on last year’s version, but its weight and packaging volume have been optimised.

Rear

The rear axle is a totally new development. Although it still works according to the pullrod principle, its layout has been designed to better interact with the airflow around the rear of the car, while further improving the tyre management.

There is also potential for improvement in how the tyres are used in qualifying, as Morris explained: “Our car looked after its tyres very well during races last year. However, we had problems now and again when it came to getting the maximum out of them in qualifying. We’ve looked at this phenomenon closely and made the required adjustments.”

Double DRS systems are banned in this year’s technical regulations and the sporting regulations now stipulate that, during qualifying, DRS can only be activated in those areas of the circuit where it is permitted during the race. The

demands placed on the aerodynamic efficiency and rear wing design, are therefore slightly different now. “We expect this to be an area where we see various developments introduced over the course of the season,” said Morris.

Another high priority was reducing the car’s overall component weight, to allow a better distribution of the ballast, while retaining its structural requirements and mechanical setup flexibility. “My colleagues have done an excellent job here, and we have even exceeded our original targets”, praised Morris.

Like last year, the Sauber F1 Team will use a basic version of the car for its rollout event and introduce a major update before the first race of the season.

“We have set ourselves lofty goals with the Sauber C32-Ferrari, and I’m confident that we’ll be able to meet them. The C31 gave us a very good basis, to which we’ve made further improvements. Our aim is to line up for 2013 with a car that is competitive from the first race, but which also offers extensive potential for further development,” summed up Morris.

Sauber C32-Ferrari – Technical details

Chassis	carbon-fibre monocoque
Front suspension	upper and lower wishbones, inboard springs and dampers activated by pushrods (Sachs Race Engineering and Penske)
Rear suspension	upper and lower wishbones, inboard springs and dampers actuated by pullrods (Sachs Race Engineering and Penske)
Brakes	six-piston brake callipers (Brembo), carbon-fibre pads and discs (Brembo)
Transmission	Ferrari 7-speed quick-shift carbon gearbox, longitudinally mounted, carbon-fibre clutch
Chassis electronics	MES
KERS	Ferrari
Steering wheel	Sauber F1 Team
Tyres	Pirelli

Wheels	OZ	
Dimensions	length width height track width, front track width, rear	5,240 mm 1,800 mm 1,000 mm 1,495 mm 1,410 mm
Weight	642 kg (incl. driver, tank empty)	

Ferrari 056 engine

Type	naturally aspirated 8-cylinder, 90° cylinder angle
Engine block	sand-cast aluminium
Valves / valve train	32 / pneumatic
Displacement	2,398 cc
Bore	98 mm
Weight	> 95 kg
Electronic injection and ignition	

Team

Organisation - tasks and people

President of the Board of Directors	Peter Sauber (CH)
Team Principal	Monisha Kaltenborn (AT)
Driver number 11	Nico Hülkenberg (DE)
Driver number 12	EstebanGutiérrez (MX)
Test and reserve driver	Robin Frijns (NL)
Marketing Director	Alex Sauber (CH)
Operations Director	Axel Kruse (DE)
Chief Designer	Matt Morris (GB)
Head of Aerodynamics	Willem Toet (GB/AU)
Head of Vehicle Performance	Benjamin Waterhouse (GB)
Team Manager	Beat Zehnder (CH)
Head of Track Engineering	Tom McCullough (GB/FR)
Senior Strategy Engineer	Giampaolo Dall'Ara (IT)
Race engineer for Nico Hülkenberg	Marco Schuepbach (CH)
Race engineer for Esteban Gutièrrez	Francesco Nenci (IT)
Chief Mechanic	Reto Camenzind (CH)
Head of Communications	Hanspeter Brack (CH)

Hinwil - Headquarters and facilities

Coming from Zurich, you pass its eponymous lake on your right and drive southeast for half an hour before reaching Hinwil. This municipality of 10,000 at the foot of the 1,115-metre Bachtel mountain is a rural community. International visitors tend to be heading for one place: Sauber Motorsport AG, which is itself eminently international: the 300 or so staff listed at the start of the 2013 season represent more than 20 different nationalities. In addition to the Hinwil workforce, some 150 full-time employees of suppliers and service providers in the region depend for their livelihood on the company founded by Peter Sauber back in 1970.

The attractive industrial complex consists of three sections which were built in succession and, thanks to farsighted forward planning, were linked up in an ideal way. Located between the first factory and office building (completed in 1992) and the wind tunnel building (opened in 2004) is the most recent extension, which was occupied at the end of 2007. This increased the surface area for offices and production facilities to 15,600 square metres, not counting the wind tunnel.

Form follows function. Notwithstanding the architectural appeal of the edifices, the overall concept adhered to a strictly practical brief that ensured short distances and optimal work flows. Efficiency is a paramount aspect, as seen for example in an enclosed bridge that links the wind tunnel with the area housing the design office.

On the ground floor is the truck bay, with adjacent space for major production equipment such as the portal milling machine. Also housed here are the mechanical production department and the autoclaves. The eroding machines, quality control and warehouse are located on the first floor.

The second floor has a particularly fascinating design. The central area is an atrium. This is where the Formula One racing cars are serviced and, thanks to its design, the cars can also be seen from the third floor. The second upper floor also houses the carbon-fibre, car body, hydraulics and rapid prototyping departments, with the administration, design office and electronics department on the level above.

Wind tunnel

Immediately adjacent to the latest building stands the state-of-the-art wind tunnel, which went on stream in spring 2004. The exterior view of this structure, which measures 65 metres long by 50 metres wide and 17 metres high, is arresting with its glazed façade. Inside it are the workplaces of highly qualified specialists. In addition to the aerodynamicists, these also include model

designers and model builders, CFD (Computational Fluid Dynamics) engineers and other staff from the aerodynamics department.

The facility boasts cutting-edge technology for all the relevant aspects such as wind speed, size of the test section and of the models, dimensions of the rolling road, model motion system and data collection.

The wind tunnel is designed as a closed circuit, measuring 141 metres in length (without the test section) and with a maximum tube diameter of 9.4 metres. The overall weight of all the steel elements plus the fan housing comes to 480 tonnes. The single-stage axial fan with carbon rotor blades uses 3,000 kW at full load.

At the heart of any wind tunnel is the test section. Both its diameter and the length of the rolling road are generously sized to provide optimal conditions for precise results. Testing with the actual racing car is technically possible, but tends to be the exception due to the regulations. Work is carried out almost exclusively using 60-percent scale models.

To allow the test models to be exposed to the air stream not just frontally but at an angle of up to ten degrees as well, the entire measuring platform can be rotated. The platform features a rotating steel belt which simulates the relative motion between the vehicle and the road and which runs in sync with the flow of air. Load cells are mounted under the belt to measure wheel loads.

Externally, the elegant wind tunnel building appears as a homogeneous hall, whereas in fact it consists of clearly separate elements: the actual wind tunnel and a wing with work offices and an event platform where partners and sponsors can hold events in a unique setting. The first-floor gallery has room for 150 guests.

This area is divided from the technical section by a glass wall, which ensures that the visual link is preserved while insulating it against the noise from the wind tunnel.

Driver

Nico Hülkenberg

A driver who knows what he wants

Nico Hülkenberg is fast, ambitious and determined. His first taste of racing – in a kart, aged seven – left him in no doubt where his heart lay (on the race track) and where he saw his future (in Formula One). “I was very lucky that my father was a big motor sport fan,” he recalled. “When I asked him if I could drive, he agreed straightaway.” A good decision, you’d have to say.

The rest is history. The 2012 Brazilian Grand Prix was one of the highlights of Hülkenberg’s F1 career so far. The German was in the mix for the race win and came close to staging a major coup. For 30 laps of the Sao Paulo track he majestically, spectacularly fought off all-comers to maintain his lead, eventually crowning his 2012 season with a well deserved fifth place and 11th in the final drivers’ standings. Indeed, top performances from Hülkenberg have long since lost their surprise factor and now he’s preparing for a new challenge going into the 2013 season after signing for the Sauber F1 Team.

Never let up

In 2002 Nico Hülkenberg, by then 15-years-old, won the German junior karting championship, and three years later he clinched the Formula BMW ADAC championship title in his home country. The next milestone was not long in coming, as Hülkenberg followed a successful A1GP series campaign with the step up into the Formula 3 Euro Series, and also won the prestigious Masters of Formula 3 race in Zolder. The role of team leader seemed practically tailor-made for him. His strength as a wheel-to-wheel racer was already an established part of his repertoire – and it remains one of his biggest strengths today, alongside his racing intelligence. The young driver’s performances brought him onto the radar of the Williams Formula One team, who invited him to test with them. Hülkenberg impressed once again and signed a contract as the team’s test driver in 2008. A stint in the GP2 Series – and another stream of rave reviews – followed in 2009, culminating in a comfortable championship title win set up by five race wins.

The importance of home

The road to Formula One is a rocky one for any driver, and a strong work ethic – which Nico undoubtedly possesses – goes a long way to ensuring success both on and off the track. Not many drivers make it into the blue-riband

category of motor racing. Talent is essential, of course, for a driver to reach the top, but so is the right support. They need a family who are willing to do all they can to help them through their career, and Nico Hülkenberg could not have asked for a better hand in this respect; without his parents he would not be where he is today. He has never been under any illusions about the risk of putting all his eggs in one basket, but that wasn't going to hold him back: "From the moment I first sat in a kart it was clear that I would stick at it. I never thought about the possibility of failure – or at least I suppressed it at tougher times."

The team player

Nico Hülkenberg is renowned for his ability to work as part of a team. It is not a duty for him, more a central cog of his personality. As well as displaying a sound technical understanding of the car, he makes an equally valuable contribution to the positive spirit within the team with his relaxed, humorous and open manner. "We have been watching Nico for some time now and he has made a convincing case for himself with his performances," explained Team Principal Monisha Kaltenborn. "He has already shown on several occasions that he can seize the chance if it presents itself. But high spots are only one side to being a racing driver. Working constructively with the team also plays a key role, and here again I have faith in Nico. I'm sure he will fit into our team very well."

The German driver has various reasons for moving to the Swiss team, from the potential of the team to the opportunity for personal development. However, his main motivation was the chance to take another step forward in his career. The evidence of last year, when the team demonstrated how much they could get out of the car, clearly left an impression: "Those four podium finishes didn't come about by chance. I'm convinced that there is a good future for me here and that I can perform well for the team," he said, summing up his move to the Sauber F1 Team in typically open, ambitious and determined tones.

Nico Hülkenberg

Date/Place of birth	19th August 1987 / Emmerich (DE)
Nationality	German
Website	www.nicohulkenberg.net
Height / Weight	1.84 m / 74 kg
Hobbies	Tennis
Favourite food	Japanese - Itaka
Favourite drink	"Spezi" (cola and orangeade mix)
Favourite music	House
Favourite track	Spa, Monaco, Suzuka
Languages	German, English, Dutch

Career:	
2001	2nd place European Karting Championship, Cadets; 1st place Italian Junior Karting Championship
2002	1st place Italian Junior Karting Championship, 1st place German Junior Karting Championship, 8th place European Karting Championship
2003	5th place Italian Karting Championship, 1st place German Karting Championship
2004	2nd place German Karting Championship
2005	1st place Formula BMW ADAC Championship, 1st place Formula BMW ADAC Rookie Cup, Best graduate of the Speed Academy, 3rd place Formula BMW World Final
2006/2007	1st place A1GP Series, 1st place Formula 3 Masters in Zolder (NL)
2008	1st Formula 3 Euro Series, 2nd place Formula 3 Masters in Zolder (NL), Formula One test driver (Williams F1 Team)
2009	1st place GP2 Series, Formula One test driver (Williams F1 Team)
2010	14th place FIA Formula One World Championship, 22 points (Williams F1 Team)
2011	Formula One test driver (Sahara Force India)
2012	FIA Formula One World Championship (Sahara Force India), 11th place, 63 points
F1 stats to date:	
First GP	Bahrain 2010
GP starts	39
Best race result	4th Spa-Francorchamps (2012)
Best qualifying	1st (Sao Paulo 2010)
Points	85
Wins	-
Pole positions	1
Podium places	-
Fastest race laps	1

Esteban Gutiérrez

Step by step into Formula One

Esteban Gutiérrez has advanced from the ranks of test and reserve driver to Formula One driver. With his outstanding talent he has demonstrated that he's got what it takes for the top echelon of motor racing. Already he is well integrated in the team, where he is valued as an open, loyal and politely reserved young driver who is always willing to learn from others and implement their new insights and experiences.

Gutiérrez began his career in kart racing. He then finished runner-up in the Formula BMW USA series in 2007 and went on to win the Formula BMW Europe crown a year later. After a spell in the Formula 3 Euro Series, he switched to the GP3 Series in 2010 and stormed to the championship title with five race wins. Two seasons in GP2 followed, the second of which (2012) saw him collect three victories and finish third in the standings. Gutiérrez was given his first chance to test for the BMW Sauber F1 Team in 2009 and further opportunities have followed in the years since. His most recent outing in the Sauber C31-Ferrari was at the Young Driver Days testing in Abu Dhabi on 7th and 8th November 2012.

The team got to know Gutiérrez in 2008. He drove an outstanding season in Formula BMW Europe, which earned him the reward of a Formula One test drive in Jerez at the end of 2009. The young Mexican acquitted himself well and Sauber took him under its wing as an affiliated driver for 2010. The track schedules dovetailed nicely: with the GP3 races being held against the backdrop of the European Formula One events, Gutiérrez was always on location. That gave him frequent opportunities to listen in on the radio messages from the F1 garage and take part in technical meetings. He quickly grew into the team. "Esteban has already been part of the team for a long time and we have followed his career very closely," said Team Principal Monisha Kaltenborn. "He has great talent and now he's ready to take the leap."

Family ties

Making regular trackside appearances are his father Roberto Manuel Gutiérrez Muguerza and his mother Clara, who have six children in all. Esteban is the youngest but one and has four brothers and a sister. Chauffeuring all of them around individually was not an option for the parents, and so it was rather convenient that Esteban discovered karting as a hobby at the same time as his brother Andres, seven years his senior. For the older brother it was to remain a hobby: today he works for his father's business, which includes a supermarket chain, a wholesaler for the outlets, and a steel company.

“As children we were always busy doing things and we also had a lot of different toys,” recalled Gutiérrez. “However, when I started clamouring for a go-kart, my father was initially opposed. Fortunately, my cousin already had a go-kart, which helped my case.” After cutting his teeth in kart racing in 2004, his career soon picked up speed. At the age of 13 he began competing in races, at 15 he had switched to a single-seater race car, and at 16 he was lining up on the grid in Europe for the first time.

Gutiérrez has been with Sauber for three years now and is grateful for all the attention the team has given him and for all the input that has steadily prepared him for Formula One. “The other race series were the introduction, but now it’s the real challenge to succeed at the pinnacle of motor sport. The support from my family as well as from my sponsors has been a key factor in getting this far, and I’m very grateful to all the people who have contributed,” said Gutiérrez, summarising his big leap to Formula One driver.

Esteban Gutiérrez

Date / Place of birth	5th August 1991 / Monterrey, Nuevo Leon, Mexico
Nationality	Mexican
Website	www.estebanracing.com
Marital status	Single
Height / Weight	1.80 m / 63 kg
Hobbies	Karting, motorbike trials, golf, skiing, virtual racing
Favourite food	Italian cuisine and sushi
Favourite drink	Lemonade
Favourite music	Coldplay
Favourite race track	Hockenheim
Languages	Spanish, English, French
Career:	
2004	Kart racing: Mexican Rotax Max Challenge
2005	Kart racing: Mexican Rotax Max Challenge, 3rd place in the Grand Nationals in South Bend
2006	Kart racing: Mexican Rotax Max Challenge, 1st place North Mexican Series, 4th place in the Mexican Grand Nationals in Zacatecas; Camkart Challenge Mexico: 5 wins in 5 races; tests Formula Renault 2000 Ayrton Senna award and trophy for Achievement and Sportsmanship
2007	2nd place Formula BMW USA, Rookie of the Year, 4 wins, 8 podiums, 9 poles; tests A1 GP; Formula BMW races in Hockenheim and World Final in Valencia
2008	1st place Formula BMW Europe, 7 wins in 16 races, 12 podiums, 3 poles; 3rd place Formula BMW World Final in Mexico City; Formula Master races in Imola and German Formula 3 Championship in Oschersleben; tests Formula 3 Euro Series
2009	9th place Formula 3 Euro Series, 3 podiums (1 in the F3 Euro Series and 2 in the British F3 Int.-Invitational Division) tests Formula One (BMW Sauber F1 Team) and GP2, youngest Mexican driver in history to test an F1 Car, at 18 years old
2010	1st place GP3 Series, five wins, total of nine podiums, 3 poles; affiliated driver at Sauber F1 Team for Formula One

2011	GP2 Asia and GP2 Main Series, 1 win, total 2 podiums test and reserve driver Sauber F1 Team
2012	3rd place GP2 Series, 3 wins, total 7 podiums; test and reserve driver Sauber F1 Team

Robin Frijns

His big chance

Robin Frijns is one of the most talented drivers in international motor sport. The Dutchman laid the foundations for his career at the tender age of eight, when he lined up for his first karting race. His sights were already set on a clear goal: to make it into Formula One.

In 2012 Robin won the World Series by Renault in his first year and was listed by British magazine “Autosport” as the world’s ninth-best driver in its cross-series rankings. Now, as the Sauber F1 Team’s test driver, he is keen to show what he can do at the pinnacle of motor racing, given the opportunity. “I’ll do my best for myself and for the team, and focus on my job and my goals,” Frijns explained. “The last year was just unbelievably amazing. I’m very grateful for everything I’ve achieved up to this point and for the chance the Sauber F1 Team is giving me.”

Moving onwards and upwards

If he hadn’t already laid down a marker, Frijns put himself firmly on the motor racing map by winning the renowned Formula BMW Europe junior series in 2010. The previous year he had made observers sit up and take notice by finishing third in the overall standings as the leading rookie in the series. Following his success in Formula BMW, Frijns took the step up to Formula Renault 2.0 racing in 2011. He competed for the Josef Kaufmann Racing team in the Europacup series – and wrapped up the title ahead of time with five wins. Then, in 2012, he recorded a sensational title win in his debut season in the Formula World Series by Renault with the Fortec team.

Now the time has come to prove himself in Formula One, initially as a test driver. “The Sauber F1 Team is for me one of the best teams to really learn a huge amount about Formula One,” he said. “For years the team has offered talented young drivers the opportunity to develop and improve – and to reach great heights in the sport.”

A family without racing blood

In contrast to so many of the rising stars on the F1 radar, Frijns cannot claim a family with petrol flowing through their veins. However, he has always had a fondness for speed. When he set out in motor racing at the age of eight, there was no particular driver he idolised. It was only at 15 that he began to take an interest in the life and personality of Ayrton Senna. After watching films and reports on the legendary Brazilian, Frijns was a confirmed fan: “The way he

thought and talked about racing fascinated and inspired me immensely. He became my idol – and he still is."

Robin Frijns

Date / place of birth	7th August 1991 / Maastricht, Netherlands
Nationality	Dutch
Website	www.robinfrijns.com
Height / weight	1.71 m / 61 kg
Hobbies	Karting
Favourite food	Pasta
Favourite drink	Water, milk
Favourite music	90s music, dance
Favourite circuit	Spa-Francorchamps
Languages	Dutch, English
Career:	
1999	Indoor Championship Maasmechelen, Belgium
2000	6th place GIRS Mini
2001	2nd place VAS Championship
2002	2nd place Belgian Championship Mini, 1st place VAS Championship
2003	9th place Belgian Championship 3rd place VAS Championship
2004	1st place Club Championship 2nd place VAS Championship
2005	2nd place French Championship / Best rookie 2nd place Belgian Championship
2006	French junior champion 2nd place Belgian Championship
2007	French Kart Championship European Kart Championship
2008	2nd place French Championship 3rd place Formula BMW Europe
2009	Rookie of the Year 2009 3rd place Formula BMW Europe
2010	Formula BMW Europe Champion Six wins, 13 podiums, three pole positions
2011	Winner Formula Renault 2.0 Eurocup Five wins, nine podiums, one pole position, 4th place Formula Renault 2.0 NEC One win, seven podiums, one pole position
2012	Formula World Series by Renault 189 points from 17 races, three wins, eight podiums, four pole positions, one fastest lap

President of the Board of Directors

Peter Sauber

Entrepreneur and racer

What's in a name? As a Formula One team boss, Peter Sauber (which translates as "clean") enjoys the reputation of a straight-as-a-die racer and responsible businessman. No luxury yachts, no scandals – just the occasional decent glass of red: that's about the limit of his indulgences. He has been married to the same wife for almost five decades and makes a point of naming his racing cars after her – the C stands for Christiane Sauber. The couple have two grown-up sons and three grandchildren.

The Swiss entrepreneur built up his team in his home country – where motor racing wasn't exactly popular – and has weathered some rough times over the course of 40 years. Two thousand and ten saw him return to the pit wall after buying back the business from BMW at the end of 2009. "It wasn't by choice," he declares, "but it was the only way to save the workplaces and technical facilities."

Since then, a great deal has happened. At the end of 2011 he gave a third of the company's stakeholding to Monisha Kaltenborn. On 11th October last year – two days before his 69th birthday – he stepped back entirely from business operations, also entrusting her with the role of Team Principal. Peter Sauber remains the majority shareholder and President of the Board of Directors and, as such, he continues to influence company strategy. The operational side is handled by the management team headed up by Monisha Kaltenborn. Also on the management board is Sauber's younger son Alex (born in 1973) as Marketing Director.

This structural realignment, first and foremost with Monisha Kaltenborn as CEO, brought fresh elements into the company and also gives Sauber more breathing space. He divides his time between his house in Wilen on Lake Zurich and his second home in Laax. Time permitting, he enjoys taking his motorbike out for a spin or heading off for the ski slopes.

In January 2006, TV audiences across Switzerland's various language regions voted Peter Sauber "Swiss of the Year" for 2005, in recognition of his achievements in both the sporting and the business world.

By his own estimation, the qualified electrician would not have got very far as a racing driver, even though he became Swiss champion in 1970 in the C1, his

first self-constructed race car. But his passion for building cars proved greater and was matched by the courage it took to set up his own operation. This, along with his ability to talk others into an involvement, set the course for some remarkable achievements.

A glimpse inside the team shows ample evidence of this. Formula One is known for its rapid burnout effect on those involved, yet some team members have been on board for 25 years now. Peter Sauber has also successfully applied his powers of persuasion to negotiations with corporate executives. In the mid-1980s he brought Mercedes back onto the international racing stage, and it was with Sauber's team that BMW planned a long-term future in motorsports crowning discipline.

When, to everyone's surprise, things worked out differently, he unhesitatingly intervened to secure the survival of his team. In Sauber's book that's what being an "entrepreneur" is all about.

Peter Sauber

Date / place of birth	13th October 1943 / Zurich, Switzerland
Nationality	Swiss
Residence	Wilen (CH)
Marital status	Married to Christiane, sons Philipp (1971) and Alex (1973)
Hobbies	Motorcycling, skiing, horse-riding, golf
Career:	
1970	Swiss champion (as driver) in a self-built sports car (Sauber C1)
1976	Interserie championship title, Herbert Müller (Sauber C5)
1982	Debut in World Sports Car Championship
1986	Victory in the Nürburgring 1000 km race, Nürburgring (Sauber-Mercedes C8)
1989	World Sports Car Championship manufacturers' and drivers' title (Sauber-Mercedes C9), one-two in the Le Mans 24 Hours
1990	World Sports Car Championship manufacturers' and drivers' title (Sauber Mercedes C11), setting up of junior team with Michael Schumacher, Karl Wendlinger, Heinz-Harald Frentzen
1993	Formula One debut at the South African GP, 5th place for JJ Lehto (Sauber C12)
2001	4th place in the Constructors' World Championship with Kimi Räikkönen and Nick Heidfeld (Sauber C20)
January 2006	BMW takes a majority stake in the team, Sauber takes on an advisory role in the BMW Sauber F1 Team;

	Sauber named 2005 “Swiss of the Year”
2007	101 World Championship points, 2nd place in the Constructors’ World Championship
2008	135 World Championship points, 11 podiums, one-two in the Canadian GP with Robert Kubica ahead of Nick Heidfeld, 3rd place in the Constructors’ World Championship
November 2009	Team bought back from BMW
2010	The Sauber F1 Team competes as a private team. 44 World Championship points, 8th place in the Constructors’ World Championship
2011	44 World Championship points, 7th place in the Constructors’ World Championship
October 2011	Peter Sauber retires from his post as Team Principal
2012	126 World Championship points, 4 podium places, 6th place in the Constructors’ World Championship

Team Principal

Monisha Kaltenborn

Charm and perception

As a child her ambition was to be an astronaut. When she made her first acquaintance with the world of motor sport, she was determined one day to compete in the Paris-Dakar Rally. Monisha Kaltenborn had no time for minor aspirations. She plotted her career path early on: law was what interested her, and she also had an executive position firmly in mind. Now aged 41, Kaltenborn's career trajectory led her from the Fritz Kaiser Group straight into Formula One. In 2010 she was appointed CEO of the Sauber F1 Team – the first woman to head up the business operations of an F1 outfit. On 11th October 2012 she also took on the role of Team Principal.

She was still a child when her family decided to emigrate from their homeland of India and settle in a different part of the planet. "Back then it happened not out of necessity but more out of curiosity," she recalled, "and in the end my parents opted for Vienna." It was there that Kaltenborn completed her law degree and took on Austrian citizenship. She was to continue her law studies at various internationally renowned universities, worked for the United Nations as well as for German and Austrian law firms. When she joined the Fritz Kaiser Group in 1998, Kaiser was a shareholder in the Red Bull Sauber F1 Team. The group's legal and corporate affairs became Kaltenborn's responsibility. When Kaiser sold off his shares in the team at the turn of the millennium, she moved to Hinwil to run the Sauber Group's legal department. She has been on the Board of Management since 2001, which she now heads after her appointment as CEO in 2010.

Negotiating watertight contracts with drivers, sponsors and suppliers was her daily fare over all those years. She also dealt with relations with the FIA, the commercial rights holder FOA, and FOTA. Prior to 2010 she rarely appeared on the public radar, though she was well known to company directors and key figures such as Bernie Ecclestone and Jean Todt. Unlike a former team boss: "For a whole year he assumed I was Peter Sauber's interpreter," Kaltenborn recalled with a laugh. She has no problem in graciously allowing a man in a man's world to believe what he wants and will occasionally conceal her razor-sharp mind behind a smile. "Being underestimated can sometimes be an advantage to be exploited," she said.

Kaltenborn is involved in the FIA's Women & Motorsport Commission, founded in April 2010 and headed by Michèle Mouton. At Hockenheim in 2010, she was

the first woman to attend an FIA press conference, where she was representing the team's top management. It attracted a good deal of attention at the time, but since then much has become routine. The spotlight shone on her even more brightly at the first Grand Prix held in her home country India. She rates her media profile purely in terms of whether it's good for the team or not. But her objectivity is no bar to the sheer enjoyment she takes in her job, which she will sometimes admit with refreshing candour to be "really cool". "But the truly exciting part of my job," she pointed out, "takes place behind the scenes."

Strict management structures are also de rigueur in her private life. Kaltenborn, with her family, lives in Küsnacht, just a 20-minute drive from the factory. When a rare window of leisure time opens up, she will usually make the most of it on a yoga mat, on the tennis court or on a rare visit to the opera.

Monisha Kaltenborn

Date / place of birth	10th May 1971 / Dehradun, India
Nationality	Austrian
Residence	Küsnacht (CH)
Marital status	Married to Jens, one son (2002), one daughter (2005)
Hobbies	Yoga, tennis, opera
Career:	
1990-1995	Law degree at the University of Vienna (AT), qualified as Magister iuris
1994	Seminar on International Civil Law, Hague Academy for International Law (NL)
1995	Research assistant at the UN Organisation for Industrial Development in Vienna; research work for the UN Commission for International Trade Law in Vienna
1996	Master of Law, International Business Law, at the London School of Economics (GB)
1996/1997	Law firm Gleiss, Lutz, Hootz, Hirsch in Stuttgart (DE)
1997/1998	Law firm Wolf, Theis + Partner in Vienna (AT)
1998/1999	Fritz Kaiser Group, legal and corporate affairs of the Red Bull Sauber F1 Team
2000	Sauber Group, Head of the Legal Department
2001	Member of the Board of Management
From January 2010	CEO Sauber Motorsport AG
End of 2011	Receives a third of the company's stakeholding
October 2012	Takes over from Peter Sauber as Team Principal

Technology and background

Monocoque

The monocoque constitutes the core of every Formula One car. It is the driver's workplace and survival cell in one. The engine is flanged onto it at the rear, the car's nose at the front. The shape of the monocoque is dictated by various factors. These include the dimensions – as per regulations – of the cockpit opening, for example, as well as the length of the wheelbase, the size of the fuel tank, the driver's measurements and various aerodynamic requirements.

In the design process for the monocoque, the first stage is to define the surface form. Following that, finite-element calculations are carried out to ensure that the safety cell complies with the necessary levels of rigidity and strength identified by the engineers. These are based on the one hand on the dynamic loads experienced by the car, and on the other on the safety stipulations of the FIA. Standards have become increasingly stringent over recent years, ensuring a significant increase in passive safety for the drivers. The most important tests are the frontal crash (with the nose section) at a speed of 15 m/s, the side-on impact at 10 m/s and the stationary load test for the rollover bar, which has to withstand around 12 tonnes of pressure. A total of five dynamic and 14 stationary tests are carried out on the car as a whole.

The monocoque consists of a carbon-fibre/aluminium honeycomb composite, which makes for extremely high rigidity and strength while keeping weight low. The composite engineers work out how many layers of carbon fibre are needed in which areas of the car so as to fulfil the diverse requirements. Here they can also select various types of carbon fibre, depending on whether forces are exerted from a single direction or several. In areas subjected to particularly high loads, up to 60 layers of carbon fibre may be stacked on top of each other. In total, a monocoque is made up of some 1,500 individual carbon-fibre elements.

It consists of two half-shells into which additional strengthening elements are glued. Following several curing stages in the autoclave, the two halves are glued together. The final stage involves the assembly of numerous securing components.

Their extremely high strength means that monocoques provide drivers with maximum protection even in major accidents. Because the fuel tank is also contained within the monocoque, dramatic accidents involving fires are a thing of the past. After a crash, the safety cell can almost always be repaired.

At Hinwil, four monocoques are built per year for use in races and testing as well as for rig tests. Every single safety cell has to be homologated by the FIA, although only the first example has to pass the full range of tests.

Carbon fibre

With the exception of the engine, gearbox components and wheel rims, a Formula One car is made almost entirely of carbon fibre. The salient properties of carbon are its high rigidity and strength coupled with very low weight. It compares with steel in terms of rigidity, yet it is around five times lighter. The downside is the highly complex manufacturing process and the high cost of the material: one square metre of pre-impregnated carbon-fibre sheeting costs from 50 to 200 euros.

Carbon fibres have a diameter of five to eight micrometres. Generally, between 1,000 and some 20,000 fibres are bundled together before being woven into fabric-like structures.

Approximately 20 different types of carbon-fibre material are used in Formula One, largely distinguished by their structure and the type of resin with which they are impregnated. If forces only come from one direction, a unidirectional weave is used, whereas forces emanating from various directions require a bidirectional weave. Specialist composite engineers determine which weave is required with which resin and how many layers are needed to achieve the desired properties.

The manufacturing process for carbon-fibre parts involves several stages. First the component is designed on the computer by means of CAD (Computer Aided Design). This data is then refined and serves as a basis for CAM, or Computer Aided Manufacturing. Using a five-axis milling machine, the form is cut into a tooling block that serves as a positive mould. The laminators lay the pre-shaped carbon-fibre pieces on this tooling block. Once this process has been completed, the entire item is packed into a polythene bag, vacuum-sealed and placed inside an autoclave, where it is cured for ten to 20 hours at a temperature of around 50°C. Following some final touches, the resulting negative mould is then ready to be used for the manufacture of the actual carbon-fibre component.

The laminators lay the pre-shaped carbon-fibre pieces on top of and alongside each other in the negative mould following plans drawn up by the composite engineers. Depending on the component, these can number up to several hundred. When everything is ready, the mould with its carbon-fibre inlay is likewise packed into a polythene bag, vacuum-sealed and baked for five or six hours at a temperature of approx. 150°C. After this curing process, the individual parts are further refined and combined to form complete components. A front wing, for example, consists of around 20 individual carbon-fibre parts. For components that have to be exceptionally robust, Kevlar or Zylon are used alongside the carbon fibre.

Brakes

As a rule, it is not so much the speed as the deceleration that really takes a rookie driver by surprise the first time he gets behind the wheel of a Formula One car. The braking power – which can sometimes peak at over 5*g* – is quite literally breathtaking.

This kind of deceleration derives from a combination of high aerodynamic downforces and extremely high-performance braking systems. Unlike road cars with their steel brake discs, racing cars use carbon-fibre discs and pads. Not only are these components much lighter than their steel counterparts – a complete set of discs and pads weighs less than 10 kg – but they can also generate vast amounts of braking energy.

And the costs are equally impressive. A complete set of discs and pads sets you back around 13,000 euros. During a race weekend, the driver will normally use one set of brakes and pads on the Friday, then swap them for a new set that has to last throughout qualifying and the race itself.

While carbon fibre is used for the discs and pads, the six-cylinder front and rear callipers are made of aluminium alloy. On safety grounds, Formula One cars have two brake circuits, one front and one rear, and therefore also two master cylinders – one for each circuit. The diameter of the master cylinder is variable, depending on the preferences of the driver. A smaller-diameter master cylinder limits maximum braking pressure but will give better feel. The driver's foot has to pile on plenty of pressure too – coming into the first chicane at Monza, drivers will typically apply anything up to 150 kg of force at the pedal. But they can be sure of getting results: cars need no more than 2.5 seconds and 130 metres to brake from 335 km/h to 90 km/h. For the driver, the effect is like being punched in the pit of the stomach.

For maximum deceleration, it is important to keep the brake discs at the right temperature. The optimal range lies between 350° and 550° Celsius, although short peaks of up to 1,000° are permissible. Different race circuits make different demands in terms of brake venting. A track like Montreal, for example, where the brakes take a lot of punishment, will require a high degree of brake cooling – unlike Silverstone, where the demand is low.

When following the safety car, the temperature of the brakes can soon fall below 200°C. This is always a challenge for the drivers, who have to increase the temperature of their brakes as much as possible just before the safety car is withdrawn and the race restarts. But they have to be careful, otherwise there is a risk the brake discs could vitrify. In other words, the surface of the discs could harden, resulting in significant loss of braking performance.

Finally, it is perfectly normal practice for Formula One drivers to alter the brake force distribution on their car during the race by using a lever in the cockpit. If the front wheels are showing a tendency to lock, the driver can direct more brake force to the rear in order to reduce the load on the front wheels. Drivers also have a second lever with which they can adjust the brake balance for each individual corner.

Seat

As well as generating immense deceleration under braking, Formula One cars also subject the drivers to over 4 *g* of lateral acceleration through corners. During a race these forces are repeatedly exerted on the drivers over a period of one-and-a-half to two hours, which means the perfect seating position is absolutely crucial as even the tiniest pressure points can lead to pain or cramp. That is why each driver uses his own seat that has been precisely tailored to his body measurements.

When a new seat is manufactured, a basic carbon-fibre shell is lined with a polythene bag. This contains either a dual-component foam or polystyrene granules which are then vacuumised. The driver gets inside the seat and waits until the mass gradually moulds itself to his body shape. While this is going on, small modifications are repeatedly carried out. In addition, the position of the steering wheel and the pedals are adjusted. When the perfect fit has been established, the seat foam or polystyrene granules are left to harden.

This kind of seat fitting will occupy a driver for between a half and a full day. The resulting seat is a transitional version which will be used for the initial tests and serve as a prototype for the permanent seat. To create the definitive seat, the interior surface of the provisional model is electronically scanned. The engineers then use this scan to create a mathematical surface based on which the shape of the seat is milled into a tooling block. Through the layering of individual carbon-fibre sheets, the final seat takes shape before being cured in the autoclave.

In the final stage the seat is given its finish, which includes cutting the apertures for the safety and rescue belts and adding a layer of padding roughly one millimetre thick. A finished seat weighs in at around three kilograms.

Steering wheel

The steering wheel of a Formula One car acts as the driver’s command centre. He uses it to steer, operate the clutch and change gear, as well as controlling numerous electronic functions by means of various buttons and switches.

The first stage of the design process involves the engineers specifying the functions that are to be controlled by buttons or rotary switches. Following that, the initial layout is determined before a provisional version of the steering wheel is made by means of rapid prototyping. Now the driver can judge whether all the controls are in just the right position. If not, he advises on where he would like changes to be made.

Manufacture of the definitive wheel can now start. A carbon-fibre shell with a lid forms the basis. The holes for the switches and buttons are drilled into the lid before the foam for the steering wheel grip is applied, which is in turn wrapped in carbon fibre. During the finishing process, various coverings are used. Depending on driver preference, the grip can be lined with leather or even with a silicon mass moulded to the shape of the driver's hands.

Now the buttons and switches are mounted and wired up to the circuit board before the display is connected as well. Since 2008 the circuit board and the display have been part of the SECU (Standard Electronic Control Unit) and are available from the FIA as standardised components.

Once all the electronics work has been carried out, the specialists start mounting the mechanical parts on the reverse of the steering wheel; these include the gearshift and clutch paddles as well as the quick release mechanism. It is a familiar sight to see drivers removing the steering wheel to get in and out of the car and then replacing it afterwards. The quick release mechanism must also pass an FIA test in which the driver has to be able to vacate the cockpit within five seconds.

Before the steering wheel is deployed on the track, it is thoroughly checked on a test rig. Once the tests have been successfully completed, the buttons and switches are glued onto the reverse of the frame – and the 1.8 kg high-tech component is ready for action.

History and statistics

Tales of the unexpected

Peter Sauber had never been particularly interested in cars, and motor racing didn't do anything for him at all. The fact that, in 2010, Sauber was able to celebrate the 40th anniversary of Sauber Motorsport had a lot to do with chance in the early days, but afterwards it was down to sheer perseverance and, later on, a good deal of hard graft and skill.

Sauber's father owned a company for electrical systems which employed around 200 staff and had premises in Zurich as well as on Wildbachstrasse in Hinwil. Sauber's career path seemed to be mapped out. He trained as an electrical fitter with the aim of gaining further qualifications and following in his father's footsteps. But it would all turn out rather differently.

In 1967 Sauber used to drive to work every day in a VW Beetle – until a friend persuaded him to have some tuning work done. For a bit of fun he then entered it in a few club races in 1967. Far more significantly, it sparked his passion for tinkering with cars. He modified his Beetle to such an extent that eventually it was no longer fit for road use. This led to the next stage in Sauber's career: in 1970 he decided to set himself up as an independent builder of open two-seater racing sports cars. Out of the cellar of his parents' home in Zurich emerged the Sauber C1. He used the first name of his wife Christiane as the model designation.

That same year, he set up PP Sauber AG and moved into a specially built workshop on his premises of his father's company in Wildbachstrasse. With the C1 he won the 1970 Swiss sports car championship, but soon whittled things down to the occasional appearance as a racing driver. In 1974 he donned his helmet for the last time before turning his full attention to car construction. The "C" was retained as a trademark.

It wasn't the easiest of tasks Sauber had set himself: surviving on constructing racing sports cars in Switzerland seemed a doomed prospect. But he would not be deterred and was determined to battle on. The working day often stretched deep into the night and money was in short supply.

Sports car successes

Sauber achieved international prominence with the C5 in which Herbert Müller won the then acclaimed Interserie championship in 1976. That was followed by his first forays at Le Mans. By this time Sauber Motorsport had four employees

on the payroll. In 1981 Hans-Joachim Stuck and Nelson Piquet won the Nürburgring 1000-kilometre race in a Sauber-built Group 5 BMW M1.

The following year was a decisive one for Sauber. He was commissioned by Swiss composite materials manufacturer Seger & Hoffmann to build a car for the Group C World Sports Car Championship: it was to become the Sauber C6. During this time he made contact with engineers at Mercedes who expressed an interest in motor sport – though all very much at a private level, as international motor sport had been an unmentionable subject for the Stuttgart carmaker since the tragic accident at Le Mans in 1955.

In 1985 Sauber began fitting Mercedes engines into his racing sports cars, moving that bit closer to the Stuttgart company. Just a year later, Henri Pescarolo and Mike Thackwell won the Nürburgring 1000 Kilometres in a Sauber C8. Further triumphs were to follow, ultimately prompting Mercedes' comeback to international motor racing. From 1988, Sauber and his crew acted as Mercedes' official works team. Professor Werner Niefer, Chairman of Mercedes at the time, decided the cars should be painted silver, marking the revival of the famed "Silver Arrows". The highlight of this partnership was the year 1989, which brought not only the drivers' and manufacturers' titles in the World Sports Car Championship, but a one-two result in the legendary Le Mans 24-hour race as well. The following year saw a repeat win of the World Championship title. Sauber Motorsport had grown to a workforce of 50.

It was also during this time that the junior team was set up, based on an idea of Sauber's business partner of the time, Jochen Neerpasch. The drivers selected were Michael Schumacher, Heinz-Harald Frentzen and Karl Wendlinger. Peter Sauber paved the way for all three to enter Formula One.

Formula One

With the lustre of the World Sports Car Championship beginning to fade, Mercedes now looked to Formula One. In the summer of 1991 it was declared a joint project, and preparations went into full swing. Sauber set about building a new factory on the company site in Hinwil.

However, that November brought with it bad news. Due to the straitened economic climate, the Mercedes board had decided against sending a works team into Formula One. Sauber had two options: to accept a financial settlement and withdraw, or to use the money as start-up capital for his own Formula One involvement. In January 1992 he took the plunge, and by autumn the first tests in the C12 were under way, with an Ilmor engine providing power. The company was then employing just under 70 staff.

On 14th March 1993, according to plan, two Sauber C12 cars driven by Karl Wendlinger and JJ Lehto lined up for the South African Grand Prix. With two World Championship points for fifth place claimed by the Finnish driver, this debut turned out an acclaimed success. Contracts signed with Red Bull and Petronas in 1995 provided a solid foundation and enabled the Swiss team to establish itself as a firm fixture in Formula One. In 1995 and 1996 Sauber served as the works team for Ford, and from 1997 onwards the cars were powered by Ferrari engines bearing the name of the title sponsor Petronas.

But the breakthrough was some time in coming. Finally, in 2001, three high points in the team's history arrived in rapid succession: the partnership with major Swiss bank Credit Suisse, fourth place in the Constructors' World Championship secured in mid-October and, just a few days later, the ground breaking ceremony for the team's very own wind tunnel.

Sauber also decided to introduce some fresh blood into Formula One at this time, signing up Kimi Räikkönen and Felipe Massa to his team and later recommending Robert Kubica to the decision-makers at BMW.

BMW

Two thousand and five saw Peter Sauber on the lookout for a new engine partner. Now in his sixties, he was not disinclined to pass his life's work on into capable hands. An offer from BMW seemed like a good solution. The car manufacturer, which had been involved in Formula One with Williams since 2000, was keen to set up its own works team. On 22nd June 2005, BMW announced its acquisition of a majority stake in the Swiss team.

The 2008 season – the third year of the BMW Sauber F1 Team – would mark the next milestone in the history of the team. The extension at Hinwil had in the meantime been completed and the workforce had crossed the 400 threshold. The team's target for that year was to achieve its maiden victory – which turned out to be a one-two, with Robert Kubica winning in Canada ahead of Nick Heidfeld. In all, the BMW Sauber F1 Team notched up 11 podium places in 2008. Kubica claimed the team's first pole position in Bahrain and Heidfeld boosted the statistics with the first two fastest race laps. The team ended the World Championship in third place with 135 points.

Following a challenging start to the 2009 season, shock news broke on 29th July: at a press conference in Munich, BMW announced it was withdrawing from Formula One at the end of the season. The company bowed out with 36 points and sixth place in the World Championship.

Starting over

The next press conference would be held on 27th November 2009, this time in Hinwil. Peter Sauber had reached an agreement with BMW and bought back his life's work. But the joy was tempered by disappointment as BMW had already decided to reduce the workforce. Employee numbers were whittled down from 388 to 260. It was with this pared-down workforce, with Ferrari as engine partner and drivers Kamui Kobayashi and Pedro de la Rosa that the Hinwil team embarked on the 2010 race season.

The first half of the season was marred by numerous retirements for technical reasons, which were unprecedented in the team's history. After the first eight races, the team had a single World Championship point to its name. By the end of the season this had risen to 44, of which Kobayashi had picked up 32, with De la Rosa and Heidfeld – who replaced the Spaniard for the last five Grands Prix – each contributing six points.

The 2011 Season

The team hired another rookie, Sergio Pérez, for the 2011 season. The Mexican's arrival meant Kobayashi would have to take on leadership responsibilities in only his second full season on the F1 grid. The year began with the team getting to grips with the tyres developed by the new sole F1 supplier Pirelli, completing a promising programme of winter testing and jetting off for an opening race in which a strong team performance ultimately gave way to frustration. Pérez and Kobayashi crossed the finish line seventh and eighth in Melbourne, only to be subsequently disqualified after a rear wing element was deemed to have contravened the rules. The team lost the ten points its performance had earned, but consolation arrived in the knowledge that the necessary speed was there. Strong showings duly followed in the next few races. In Monaco, for example, Pérez had just made it through to the top-ten qualifying shootout for the first time when he lost control of the C30 on the exit from the high-speed tunnel section and slammed into the barriers with devastating force. The Mexican youngster was initially motionless in the car. After what felt like an eternity the news came through that he had got away with severe concussion. Kobayashi went on to show great mental strength to finish fifth in the race, the best result of the season for the Sauber F1 Team. Pérez also had to sit out the next race in Canada, with De la Rosa taking his place at short notice.

After a good first half to the season, which saw the team occupying what looked like a safe sixth place in the Constructors' World Championship, the team endured a drop in form. The cause of the downturn was rooted in a controversial technology: diffusers fed by the car's exhaust flow, even – thanks to sophisticated engine mapping – when the driver is off the throttle. The FIA announced a ban on the practice, only to subsequently reverse its decision. In

the meantime, the team had stopped development of an “outboard blown” diffuser for the C30, which put it at a disadvantage against rival teams still running the technology. Despite this handicap of well over a second per lap, the young drivers still managed to add to the team’s World Championship points haul. The Sauber F1 Team eventually finished seventh in the Constructors’ Championship on 44 points. Kobayashi was responsible for 30 of those, with Pérez recording 14 points. Both Kobayashi and Pérez, together with Mexican reserve driver, Esteban Gutiérrez, were confirmed for the 2012 season as early as the summer.

The 2012 Season

The Sauber F1 Team lined up for 2012 with the unchanged pairing of Pérez and Kobayashi in the race seats. And the season began strongly, Pérez coming home eighth and Kobayashi sixth at the opening race in Melbourne. But that was only the start; even greater excitement was to follow in Malaysia, where Pérez delivered a sensational performance in fluctuating weather conditions. A clever tactical move in the early stages saw him make up a number of places, and the Mexican driver was subsequently the fastest man on a wet, then merely damp and finally drying track. Moving up into second place, he even put the race leader – Ferrari’s Fernando Alonso – under pressure before briefly running wide and losing critical seconds. Second was still an outstanding result, though, and, most of all, it underlined what an excellent car the team had developed in the Sauber C31-Ferrari.

The next highlight of the season was not long in coming. Pérez qualified 15th for the Canadian GP, but a well thought-out strategy and the Mexican’s ability to look after his tyres allowed him to work his way up to third – giving him and the team their second podium of the season at this still early stage.

The low point of the season came at Spa. The weekend had begun perfectly; Kobayashi secured second place on the grid, with Pérez starting immediately behind him. However, the race had barely begun when both the Sauber cars were involved in the same collision caused by a rival driver. Their race was ruined and the disappointment was immense.

However, compensation for the Sauber F1 Team arrived just a week later in Monza, Pérez providing further evidence of his tyre-preserving prowess. The Mexican cut through the field like a hot knife through butter – most notably in the latter stages of the race after taking on more fresh rubber – to wrap up another second place. The final highlight of the season came courtesy of Kobayashi in his home Grand Prix at Suzuka. The Japanese star had already qualified third to send his compatriots into raptures. Then he also made a fine start to the race, cementing his position at the business end of the field. Going

into the final quarter of the race he came under increasing pressure from the ever-closing Jenson Button, but the local hero held firm to set the seal on his first podium finish in Formula One. For many in the team, the podium ceremony provided the season with its most emotional moment.

It was a very good year for the Sauber F1 Team, headlined by four podium finishes, 126 World Championship points and sixth place in the constructors' standings – a position higher once again than the previous year and an achievement that earned the praise of many outside observers.

Handing over the reins

The 11th October 2012 marked a milestone in the history of the team – the day when Sauber stepped down as Team Principal and passed on the baton to Kaltenborn.

Only three teams on this year's grid – Ferrari, McLaren and Williams – have been in Formula One longer than Sauber. Between 1993 and 2012 a total of 22 drivers lined up for the Swiss team in 346 Grands Prix.

Stats (1993 through 2012)

Driver	Grands Prix for Sauber	Points for Sauber
JJ Lehto (FI/1993-1994)	18	5
Karl Wendlinger (AT/1993-1995)	25	11
Heinz-Harald Frentzen (DE/1994-96/2002-03)	64	42
Andrea De Cesaris (IT/1994)	9	1
Jean-Christoph Boullion (FR/1995)	11	3
Johnny Herbert (GB/1996-1998)	48	20
Nicola Larini (IT/1997)	5	1
Gianni Morbidelli (IT/1997)	7	0
Norberto Fontana (AR/1997)	4	0
Jean Alesi (FR/1998-1999)	32	11
Pedro Diniz (BR/1999-2000)	32	3
Mika Salo (FI/2000)	16	6
Nick Heidfeld (DE/2001-2003/2006-2009/2010)	125	194
Kimi Räikkönen (FI/2001)	17	9
Felipe Massa (BR/2002/2004-2005)	53	27
Giancarlo Fisichella (IT/2004)	18	22
Jacques Villeneuve (CD/2005-2006)	31	16
Robert Kubica (PL/2006-2009)	57	137
Sebastian Vettel (DE/2007)	1	1
Pedro de la Rosa (ES/2010/2011)	14	6
Kamui Kobayashi (JP/2010-2012)	58	122
Sergio Pérez (MX/2011-2012)	37	80
Total	**682**	**717**

World Championship points and rankings in the Constructors' World Championship

Season	Grands Prix	Points	Ranking
1993	16	12	7.
1994	16	12	8.
1995	17	18	7.
1996	16	11	7.
1997	17	16	7.
1998	16	10	6.
1999	16	5	8.
2000	17	6	8.
2001	17	21	4.
2002	17	11	5.
2003	16	19	6.
2004	18	34	6.
2005	19	20	8.
2006	18	36	5.
2007	17	101	2.
2008	18	135	3.
2009	17	36	6.
2010	19	44	8.
2011	19	44	7.
2012	20	126	6.
Total	**346**	**717**	

Sustainability

The system behind the sustainability

Environmental protection has a long tradition at Sauber. For 20 years now the team has been using local power from a nearby incineration plant to heat its main building and, since 2004, the wind tunnel as well. Around 50 per cent of the electricity used by the team is provided by renewable resources (hydroelectric power). At the end of 2011 we adopted, for the first time, a systematic approach to environmental protection by drawing up an environmental policy. Monisha Kaltenborn explained the reasons behind the move: “It is clear to see that the burden on our environment has become a key challenge for our society. By implementing our environmental policy we are aiming to face up to this challenge and fulfil our ecological responsibility. Our core business remains constructing and running Formula One racing cars. That will not change, and we will continue to do so with great conviction and equal passion. But we want to do what we do as responsibly as possible.”

Certified environmental management system

The Sauber F1 Team has made a serious commitment to the environment. On 3rd April 2012, ISO 14001 certification was awarded to the Sauber Group’s environmental management system. ISO 14001 is the most widely established standard in this area worldwide, and certification attests that the team meets all the stated requirements.

The team began the development of its environmental management system around two years ago with a comprehensive risk analysis and assessment. A set of organisational, technical and operational rules intended to ensure sustainable environmental protection was then put together with the participation of all employees.

“We are very pleased our environmental management system has been awarded certification. It confirms the high priority we attach to this issue,” explained Team Principal Monisha Kaltenborn.

Sauber’s environmental policy sets out the following principles and guidelines governing its commitment to environmental protection:

- Make the environment a management focus.
- Involve all employees in the process and ensure they have the necessary training.

- Reduce energy consumption and use renewable energy sources in place of fossil fuels.
- Reduce material consumption and ensure consistent recycling of waste materials.
- Use third-party projects to transfer knowledge into ecological mobility concepts.
- Incorporate suppliers and customers into the company's environmental activities.
- Maximise transparency towards employees, authorities and partners (inventory, targets, evaluation).

As well as the development and certification of the environmental management system, the implementation of the company's environmental policy has also prepared the ground for other projects, such as the construction and activation of a solar park at Sauber's headquarters in Hinwil, in cooperation with its partner Oerlikon.

The Sauber F1 Team goes greenhouse gas neutral

After ISO 14001 certification was awarded to the company's environmental management system in early April, the next step followed: the Swiss team operates carbon neutral. CNI is one of the world's leading companies for carbon offset schemes.

Offsetting carbon involves companies financing or part-financing projects that save the equivalent amount of carbon generated by the company. The Sauber F1 Team opted for 30 per cent excess. The key factor in this offset scheme is the judicious choice and monitoring of high-quality projects.

Monisha Kaltenborn explained: "We attach great importance to carbon offsetting, which is a consequence of the environmental policy we have adopted. It allows us to make an important contribution to protecting the environment. In Carbon Neutral Investments we have found the ideal partner for implementing these efforts. The certification of our environmental management system signified an important step towards our ecological goals and is now followed by a further step with our carbon offset commitment."

Solar park

The solar park constructed for the Sauber F1 Team in Hinwil by premium partner Oerlikon has been on stream since September 2012. It is one of the largest solar car ports in Switzerland. The construction, consisting of 1,573 technically advanced and aesthetically appealing thin-film silicon photovoltaic

modules, stretches over an area measuring 2,249 square metres. A roof of one of the factory buildings was fitted with solar modules and large sections of the company's car park were covered, which brings a number of benefits. It took just six weeks to construct the solar park thanks to the innovative and cost-efficient way the modules are fitted. The installation delivers 155,600 kilowatt hours of power per year – equivalent to the electricity needs of 44 households – and generates peak power of 173 kWp*. The energy payback time for the thin-film silicon solar modules is less than a year.

*One 1 kWp system in this geographical location produces approximately 1,000 kilowatt hours (kWh) of electricity per year and covers a surface area of around nine square metres. This equates to roughly a fifth of the annual electricity consumption of a local four-person household.