

Reflections: **future/present**



01

Fast, faster, fastest...

0.000 sec.
Human nature.
The search for speed.
Go faster, further, for longer.
You touch this limit.
Something happens.
Suddenly you can go a little bit deeper.
It's in your blood.
In every breath.
It's you.
You are it.
There is only one.
It's the zone.

Now GO!

Photos //
Marcel Hilger (Cover)
Isaac Papadopoulos



Mission Vision & Values

About Swiss Side

Swiss Side, No.1 in Aerodynamics, maximises speed and real world performance in the sports industry. Drawing on over 50 years of Formula 1 experience, Swiss Side's passion and unmatched engineering know-how drives new technologies to revolutionise and inspire.

Vision

To make future mobility faster and more efficient.

Mission

To grow Swiss Side from a sought-after brand and partner in the cycling industry to an invaluable necessity when it comes to the research and engineering of new solutions, for developing future products in the sports and light-mobility sectors.

Values

Aero is king

Performance can be measured

Deliver genuine solutions with real world performance

Never stop learning & innovating

Be genuine, transparent and inclusive

Why? Because I had to.



Photo // Marcel Hilger

About Swiss Side:

Our world needs real solutions for transport & mobility. Driving Formula 1 cars around in circles on the weekend is not that solution. Even though motorsport and speed will forever be in my blood, as the world changes, so too do our priorities. The future of transport in urbanised areas will be highly efficient, light mobility vehicles travelling at low average speeds. This is far more closely related to a bicycle than a motor vehicle or racing car. So my goal was to take highly advanced know-how and technology from the world of F1 and transfer it to the cycling industry. This was applied to learn how to develop the most efficient solutions for complete bike & rider systems. We now apply our unique know-how not only to advance passionate athletes and partners in the sports industry worldwide but more importantly, with the intention to address the urgently needed transport & mobility solutions of tomorrow. It is our responsibility to play our part in finding solutions for a sustainable future.

- Jean-Paul Ballard Swiss Side CEO and Co-Founder

CYCLING
PRODUCTS

ENGINEERING
CONSULTING



ATHLETE
& TEAM
SUPPORT

Swiss Side DNA

Research & Development

The essence of Swiss Side lies in 'Research' to develop an in-depth understanding of any problem, to in turn feed the 'Development' of new solutions, which may be physical products, technologies, or new methods for the R&D process. The Swiss Side engineering team bring specialist expertise in the core areas of aerodynamics, mechanical engineering, electronics systems, data processing & analysis systems, and prototype production.



Photo // Daniela Bleyemehl by Isaak Papadopoulos

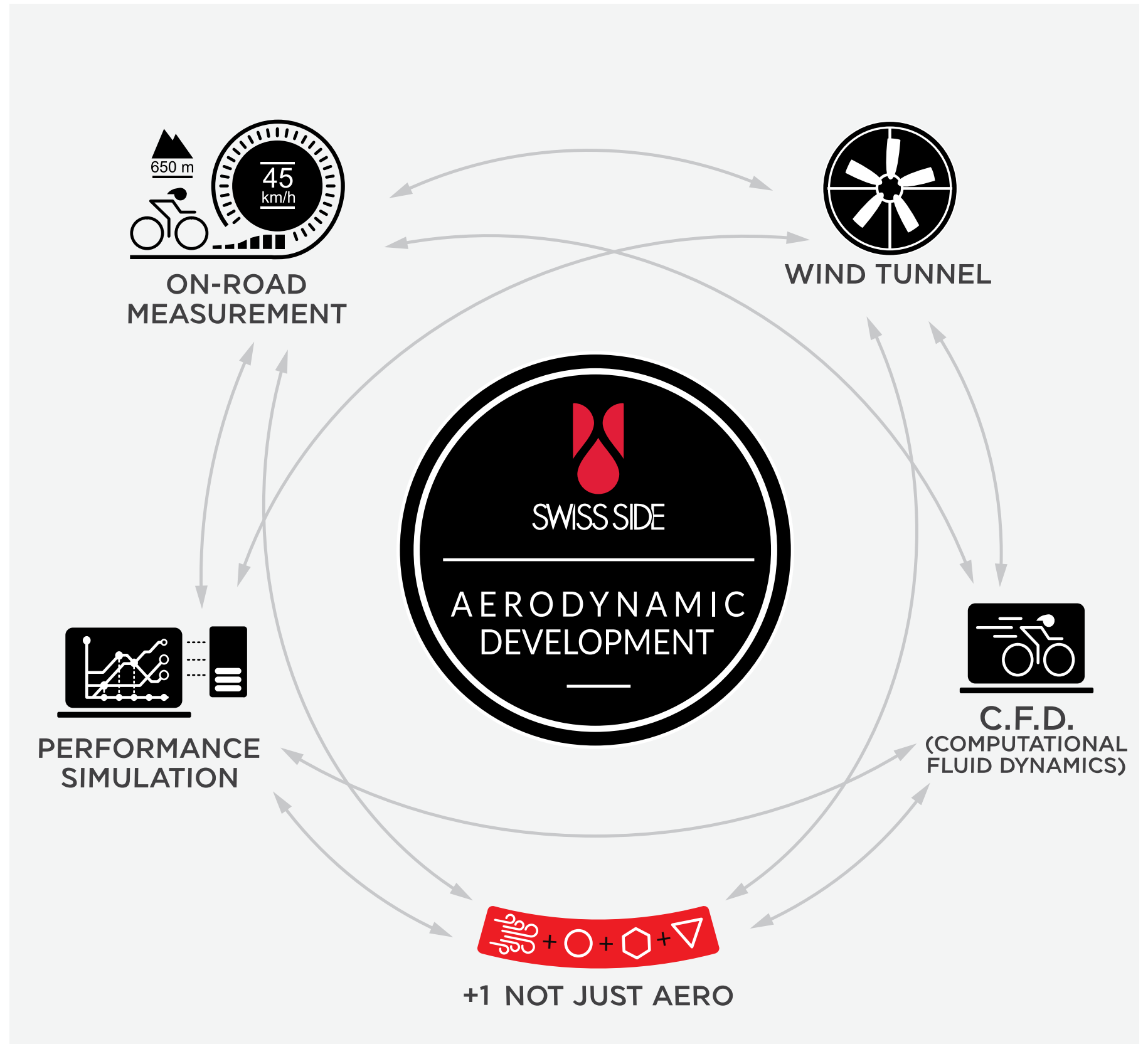
How?

4 Arms

Swiss Side aerodynamic development comprises an interconnected process of understanding (left side) coupled with development (right side). This allows for the requirements of a project and the impact of all variables to be fully understood before development begins, which in turn ensures that the solutions developed deliver the desired performance targets in the real world. Good cross-correlation for the predicted and measured performance between the 4 Arms is essential for the development process to be robust and reliable.

+ 1

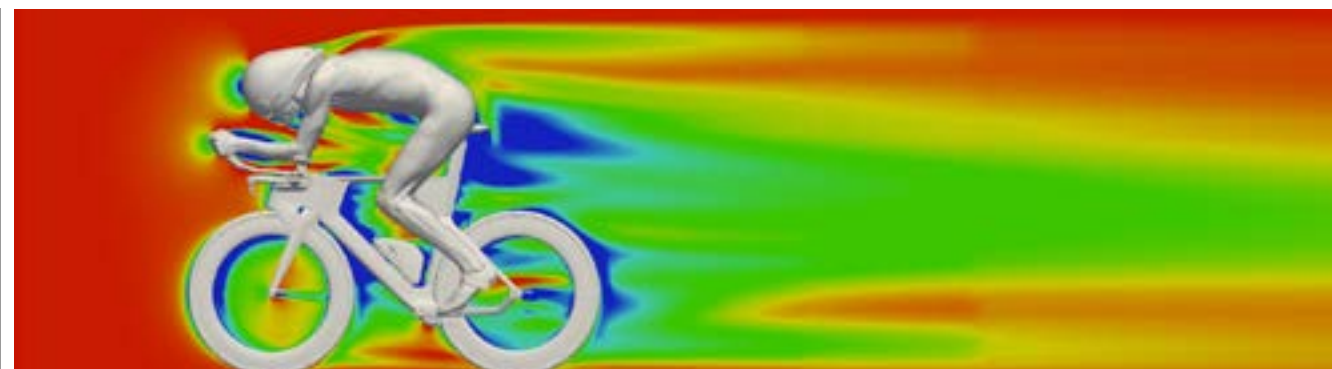
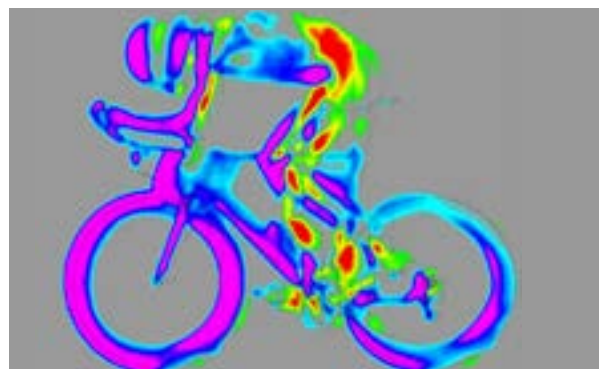
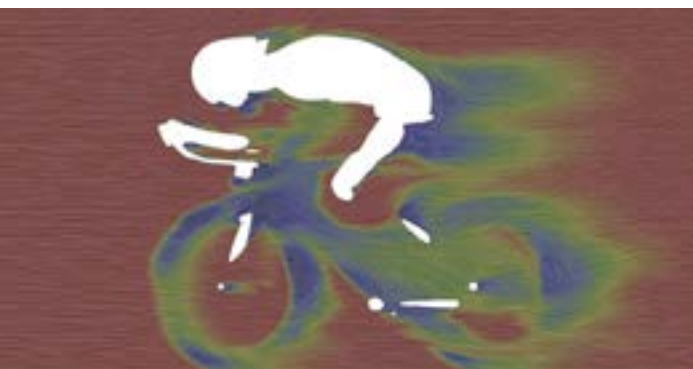
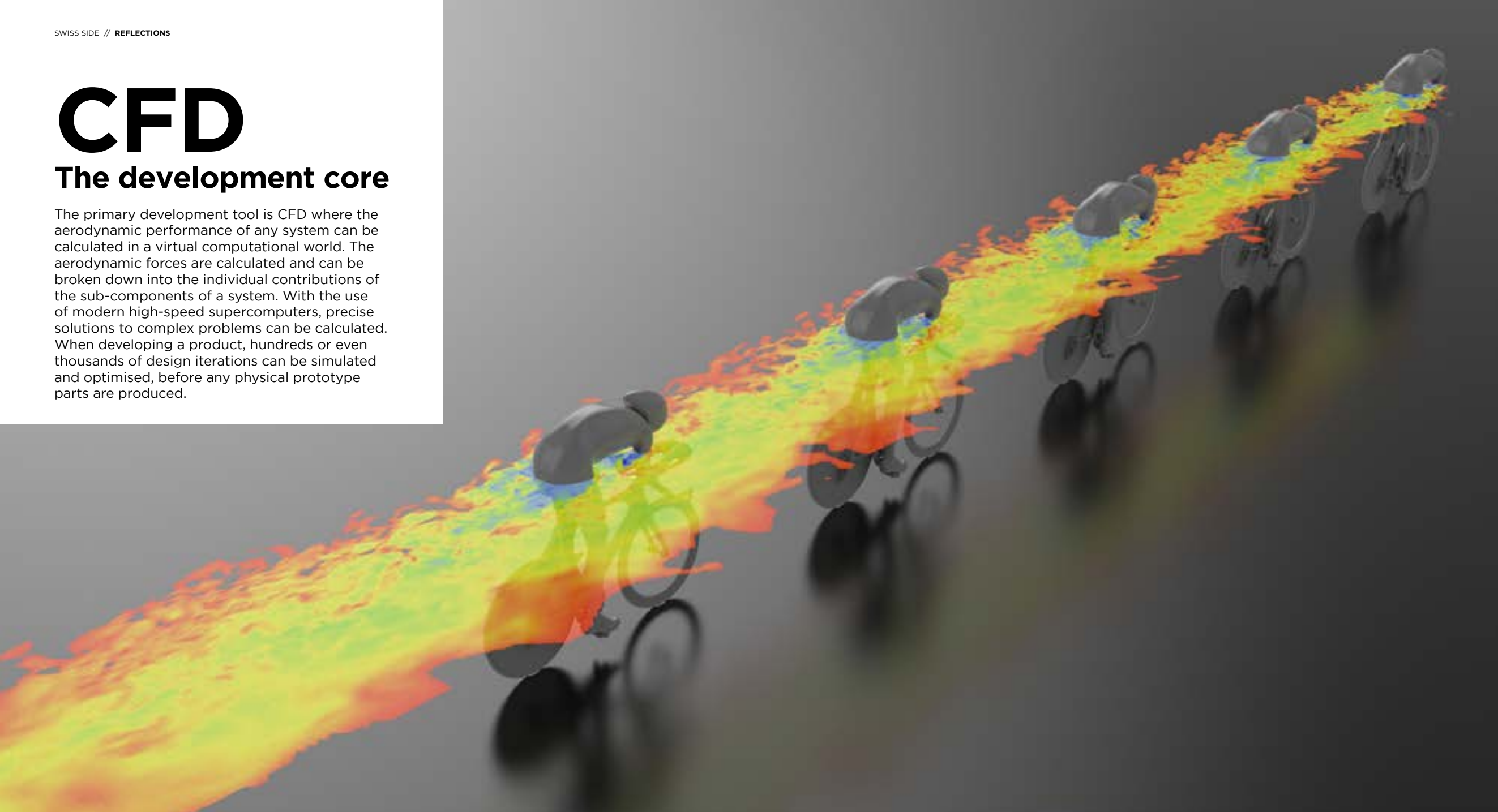
To bring physical designs to the real world for testing, competence beyond just aerodynamic development is required. Swiss Side covers all the bases necessary for performance product development solutions. The aero optimised designs are then engineered to produce physical prototypes for testing or even final products for the end user.



CFD

The development core

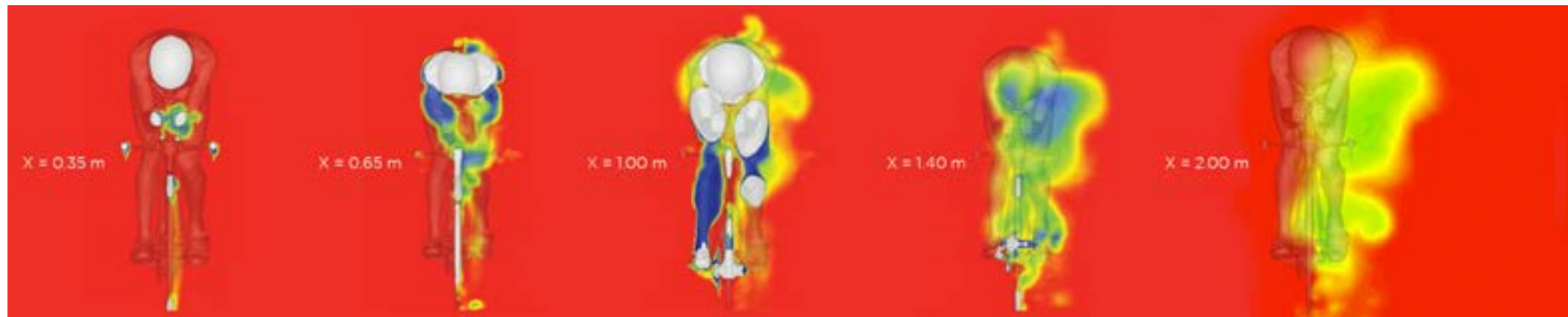
The primary development tool is CFD where the aerodynamic performance of any system can be calculated in a virtual computational world. The aerodynamic forces are calculated and can be broken down into the individual contributions of the sub-components of a system. With the use of modern high-speed supercomputers, precise solutions to complex problems can be calculated. When developing a product, hundreds or even thousands of design iterations can be simulated and optimised, before any physical prototype parts are produced.



CFD

Not just pretty pictures

Visualisations of the airflow provide an invaluable analytical tool for understanding and optimising the design of a high performance aerodynamic system. In doing this, the areas with the biggest impact on the airflow can be identified. Local airflow streamlines and angularity can be visualised and measured, as well as sections taken through models for more detailed analysis.



Wind Tunnel Systems

Precision measurement capability

The wind tunnel is key to the development process where the performance of a design is measured for the first time physically, with high precision systems, in a controlled environment.

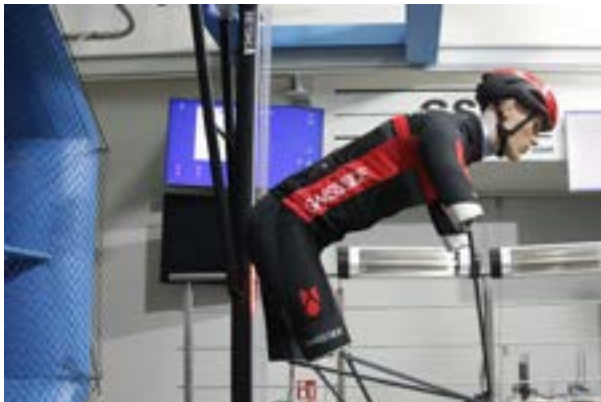


Photo // Jan van Berkel by Isaak Papadopoulos

Wind Tunnel Systems

Unique measurement systems

Swiss Side develops bespoke wind tunnel measurement systems to suit evolving R&D requirements. These include pressure measurement rakes, flow visualisation, turbulence measurement systems, and even turbulence generation devices for simulating specific real-world scenarios.



Photo // Marcel Hug by Schweizer Paraplegiker-Stiftung

Reality Bites

Real world measuring systems

Measurements in the real world provide the necessary understanding of the riding environment, which is fundamental for the development process. It is equally important, for the validation of the entire development process, to be able to measure the performance of a finished product on the road.



Photo // Maurice Clavel by Isaak Papadopoulos

Wind tower

Measuring wind shear and intensity at ground level, to more accurately characterise wind conditions relevant for cycling and light mobility vehicles which travel on the road.



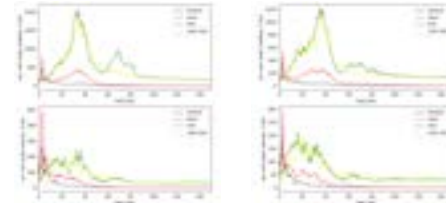
CdA-meter

The wind tunnel for the road. Accurately measuring aerodynamic drag and real environmental conditions, out on the road where it matters. This is vital for correlating with the performance measured in the wind tunnel.



On-bike pressure rake

Measuring aerodynamic drag through pressure loss in the airflow. The on-bike pressure measurement rake allows measuring and visualising where the aerodynamic drag comes from, and to compare this with measurements made in the wind tunnel.



Vibrational rolling resistance measurement

On-bike measurement systems for quantifying both 'rolling' and 'roll-over' resistance of bicycle systems, which are important forces that need to be accurately understood and modelled for the development process.

Performance Simulation

Identifying where to focus development

Simulating the predicted time, on any course with computer algorithms, allows us to evaluate the hierarchy of importance of all the performance parameters of a system. For example, aerodynamic drag vs. weight. In this way, areas for improvement can be recognised before development begins and resources directed to those areas that have the biggest impact on performance.

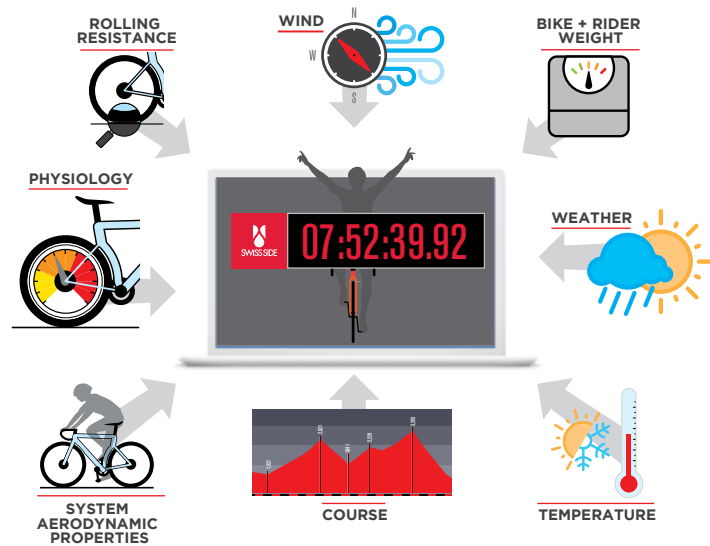
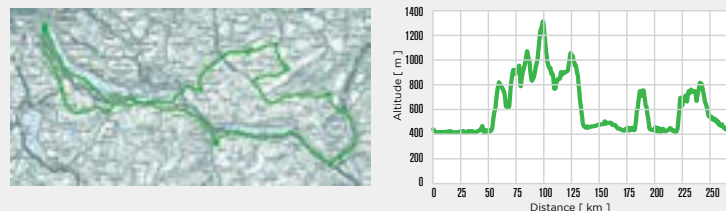


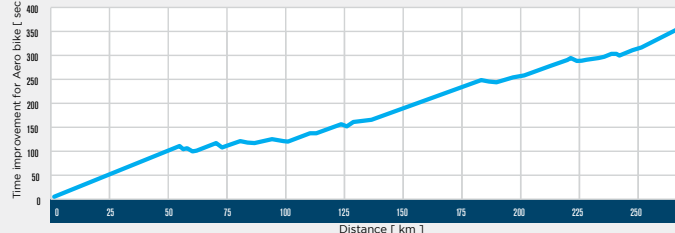
Photo // Maurice Clavel by Isaak Papadopoulos

Aero vs Weight

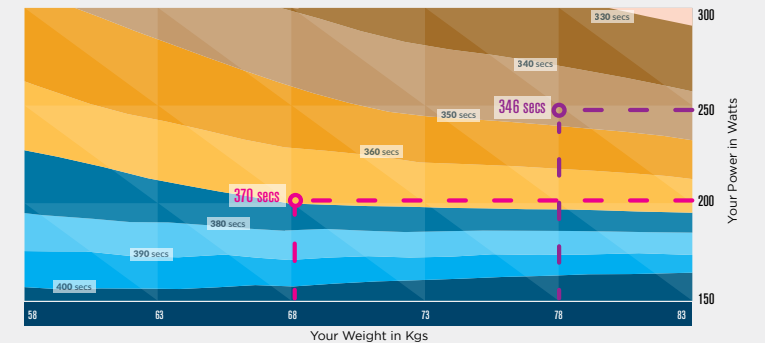
TORTOUR 2021 SPRINT COURSE



TIME SAVINGS with AERO BIKE compared to CLIMBING BIKE



CALCULATE YOUR TIME SAVINGS BY GOING AERO:



Not Only Aero

The Swiss Side one-stop-shop

To bring a concept to reality, Swiss Side provides the full range of engineering competency to deliver not just functional prototypes but final end-consumer products. The same capability is also required for developing complete systems that are central to the continually evolving Swiss Side R&D processes, where new bespoke solutions are invented and produced to fulfill R&D needs.

Together with the close collaboration of select partners, Swiss Side covers all the aspects of engineering services necessary, to provide a one-stop-shop to take an idea through to the finished product.



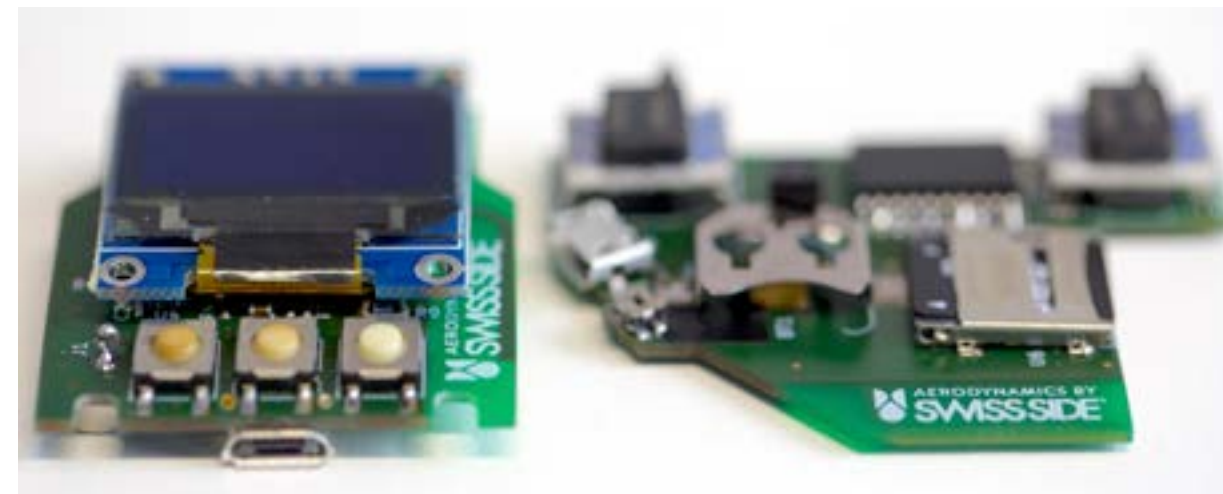
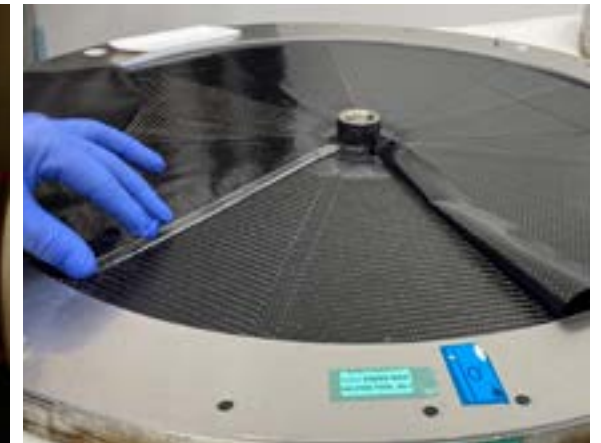
Mechanical testing

Braking performance and heat resistance testing of the Swiss Side rim brake carbon wheels.



Composite structures engineering

Production of the Swiss Side rear DISC wheel.



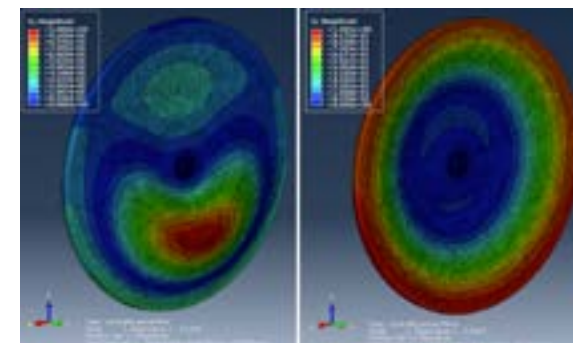
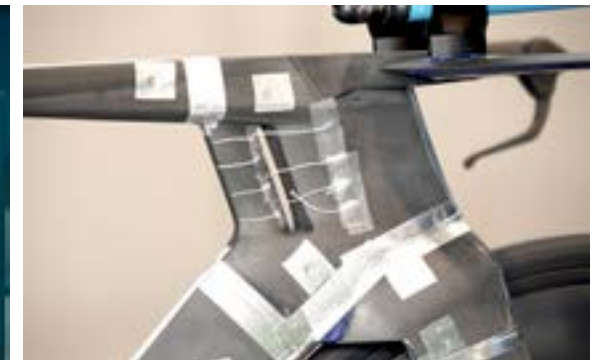
Electronic systems

Swiss Side designs and produces entire electronic systems in-house. This includes the detailed PCB and sensor system design, to the firmware and software to run these. If a system doesn't exist to suit our requirements, we design and produce our own. Such know-how is vital to any modern day R&D company.



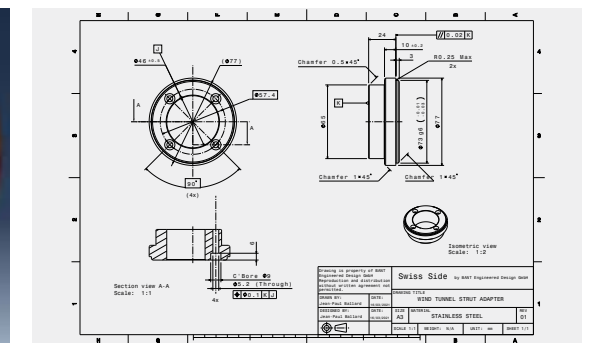
3D printing

Not just for prototyping purposes but also final structural parts. Swiss Side has years of experience designing 3D-printed parts for wide-ranging applications. Working with Switzerland's leading partners in added manufacturing, solutions for printed metals, plastics and high-performance carbon reinforced materials are provided.



FEM structural analysis

Above, the Finite Element Modelling of the Swiss Side rear DISC wheel, using a double foam sandwich, high-modulus carbon fibre composite construction.



Engineering design

From CAD modelling of complex 3D surface models, to the complete technical design and manufacture of intricate mechanical parts.

We are all Athletes

Whether you are a world champion or you are simply inspired by sport, we are all athletes. Regardless of our individual level of capability or drive, we share the common inspiration to challenge the body and mind, striving to achieve something special. This essence is ingrained in every Swiss Side product, engineered for maximum performance. Athletes remain the central focus of any development.

Designing the fastest wheel was never the primary focus. Instead, we looked at how to make the fastest bike and athlete system, and asked ourselves what we needed from the wheel to achieve this.

This holistic approach is key to performance and therefore our athlete team is an integral part of everything we do at Swiss Side.

By athletes, for athletes...

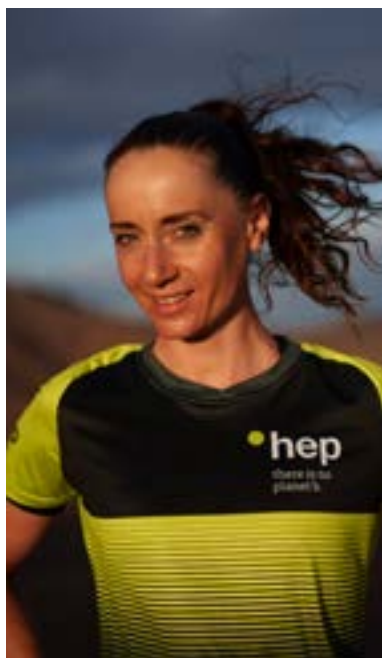
Photo //

Jan van Berkel & Badreddin Wais by Isaak Papadopoulos



Laura Philipp

The rising star
out to Kick Ass!



2021 Ironman European Champion
5 x Ironman victories
17 x Ironman 70.3 victories
3 x World Championship podium

Simply WOW!



Photos // Marcel Hilger, Philipp Seipp



Andrea Salvisberg

5 x National Champion
2nd European Championship 2018
5 x top ten Ironman results



Patrick Lange

2 x World Champion
2 x World Record Breaker
First ever under 8-hours in
the Kona Ironman World
Championships

Pioneering progress with attention to every detail. With Swiss Side, it's a perfect match. Working together to develop new record breaking technologies in the hunt for speed and efficiency.





Daniela Ryf

DT Swiss Aerodynamics by Swiss Side

4 x Ironman World Champion

5 x Ironman 70.3 World Champion



Photos // Ingo Kutsche, Marcel Hilger



Jan van Berkel

3 x Winner Ironman Switzerland (2018, 2019, 2021)
Swiss Ironman record holder



Photos // Isaak Papadopoulos

Rasmus Svenningsson

Ironman Lake Placid winner 2021 (new course record)
Ironman World Championship Age Group Champion 2018
3rd place Ironman 70.3 Dubai 2021
2nd place Ironman Austria 2021

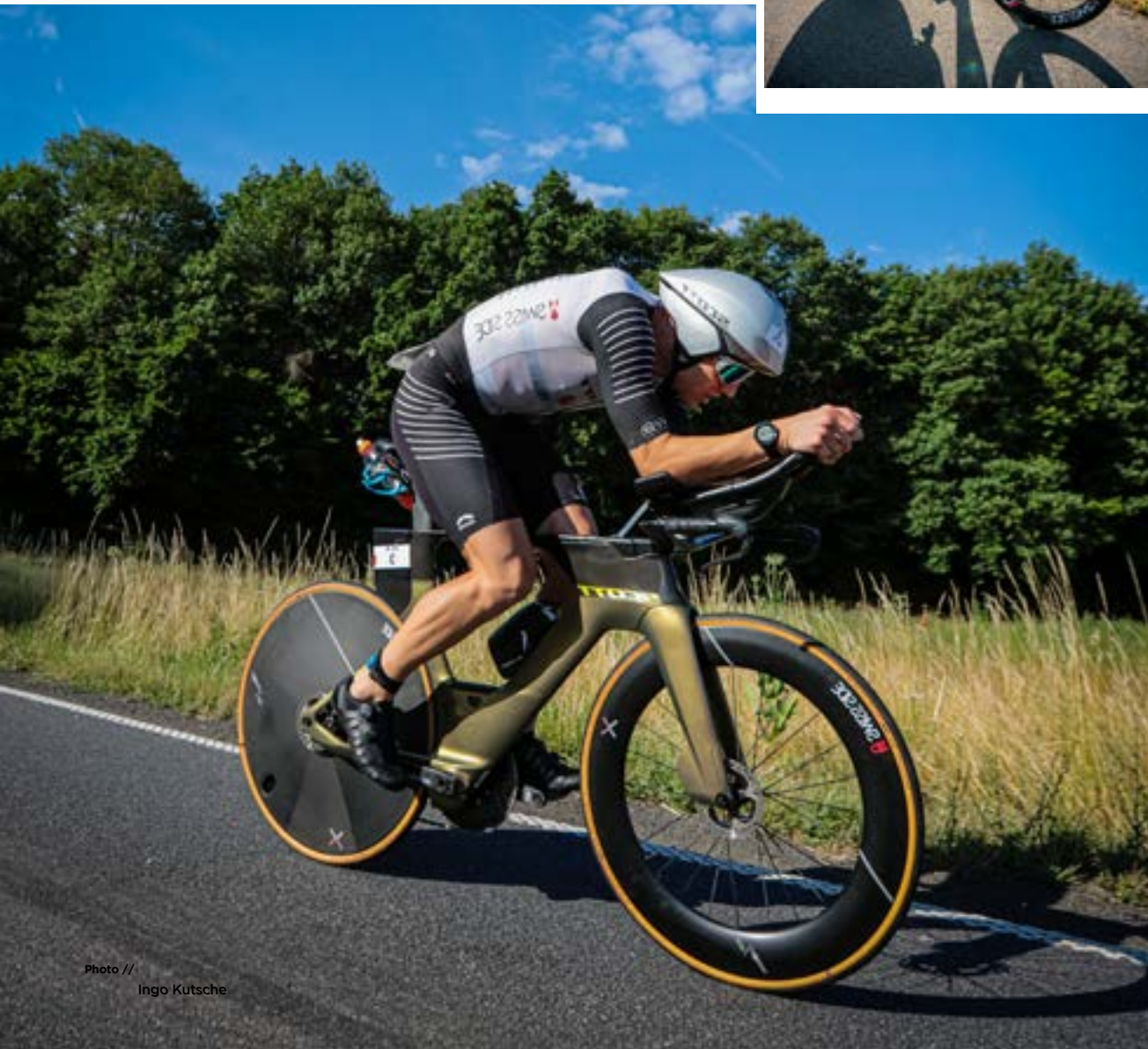


Photo // Ingo Kutsche



Andreas Dreitz

11 x Ironman 70.3 victories
2 x Ironman / Challenge victories



Photo // Top_Ingo Kutsche
Bottom_Marcel Hilger

Lisa Nordén

2 x ITU World Triathlon Champion
Olympic medalist
Winner Ironman Lake Placid 2021
on debut in the long distance



Daniela Bleymehl

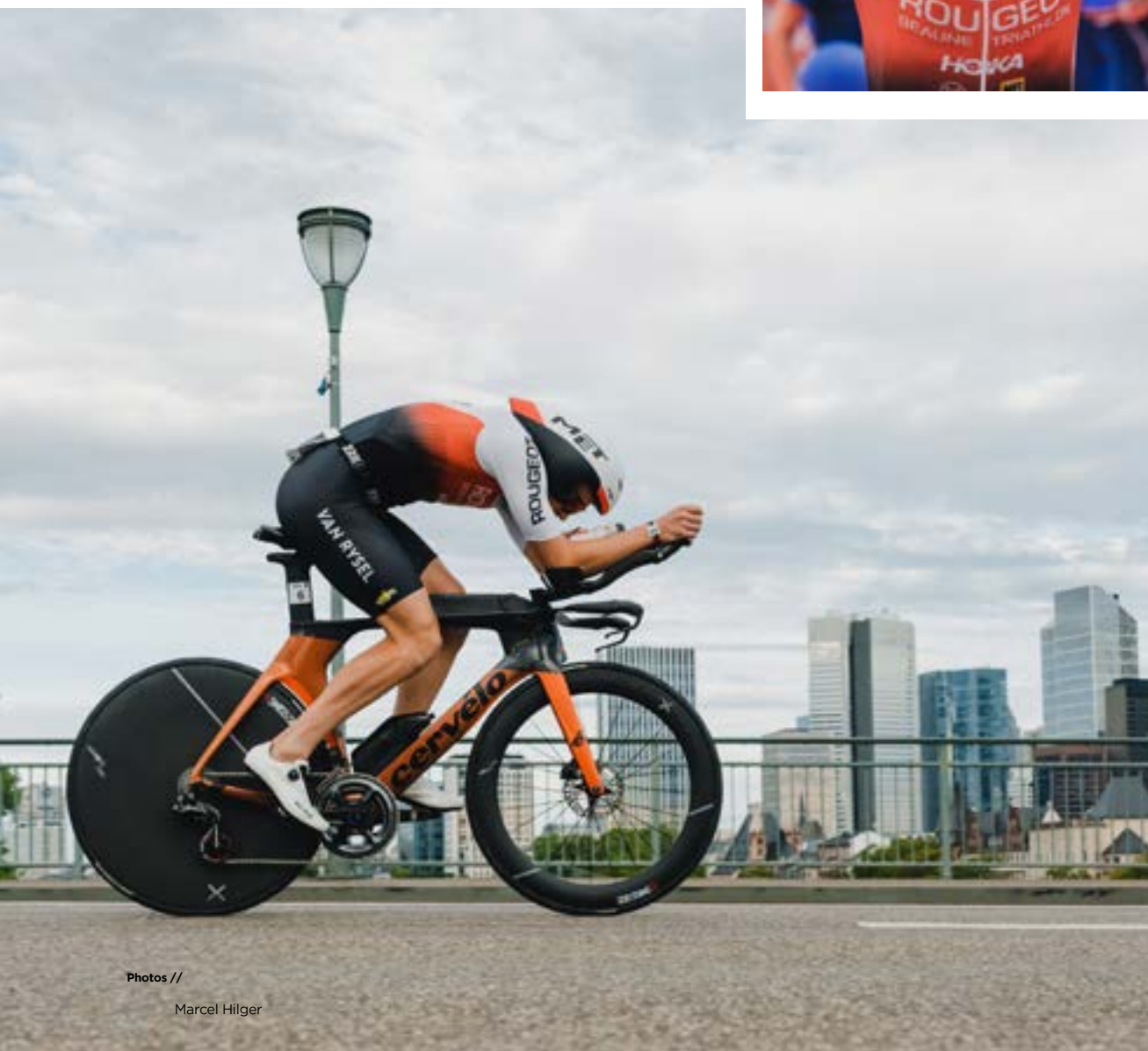
8 x Ironman / Challenge victories
5 x Ironman 70.3 / Challenge victories



Photos // Marcel Hilger, Ingo Kutsche

Denis Chevrot

4 x Ironman 70.3 victories
3 x Ironman victories



Photos // Marcel Hilger



Justine Mathieux

1 x Ironman 70.3 winner
2 x top ten Ironman podiums
multiple podium finishes

Photos // Ingo Kutsche





Partner Projects

Application in the real world

Photo // Daniela Ryf by DT Swiss AG

Swiss Silver Bullet



Swiss Side teamed up with Orthotec and the Sauber Group with the goal of developing the world's fastest racing wheelchair. Paralympian Marcel Hug, a.k.a. the Swiss Silver Bullet, was central to the project and no stone was left unturned in the hunt for speed.



Marcel Hug's position was optimised for maximum aerodynamic and power efficiency. A complete new ultra-aerodynamic chassis was specifically designed for him, with customised wheels and a steering and braking system, all containing special high-tech metal 3D printed parts.

With further extensive wind tunnel testing, Swiss Side developed an aero-suit designed specifically for Marcel's body size and the speeds of wheelchair racing, supported by the optimum helmet.

Photos //
Top_Swiss Paralympic / Gabriel Monnet
Others_ Schweizer Paraplegiker-Stiftung

Bikes



Simplon PRIDE II

Photo // Simplon and Marcel Hilger



Canyon Aeroad R065

Photo // Canyon and René Zieger



Canyon Speedmax R085

Photo // Canyon and Marcel Hilger



Cube Aerium C:68

Photo // Ralf Graner Photodesign

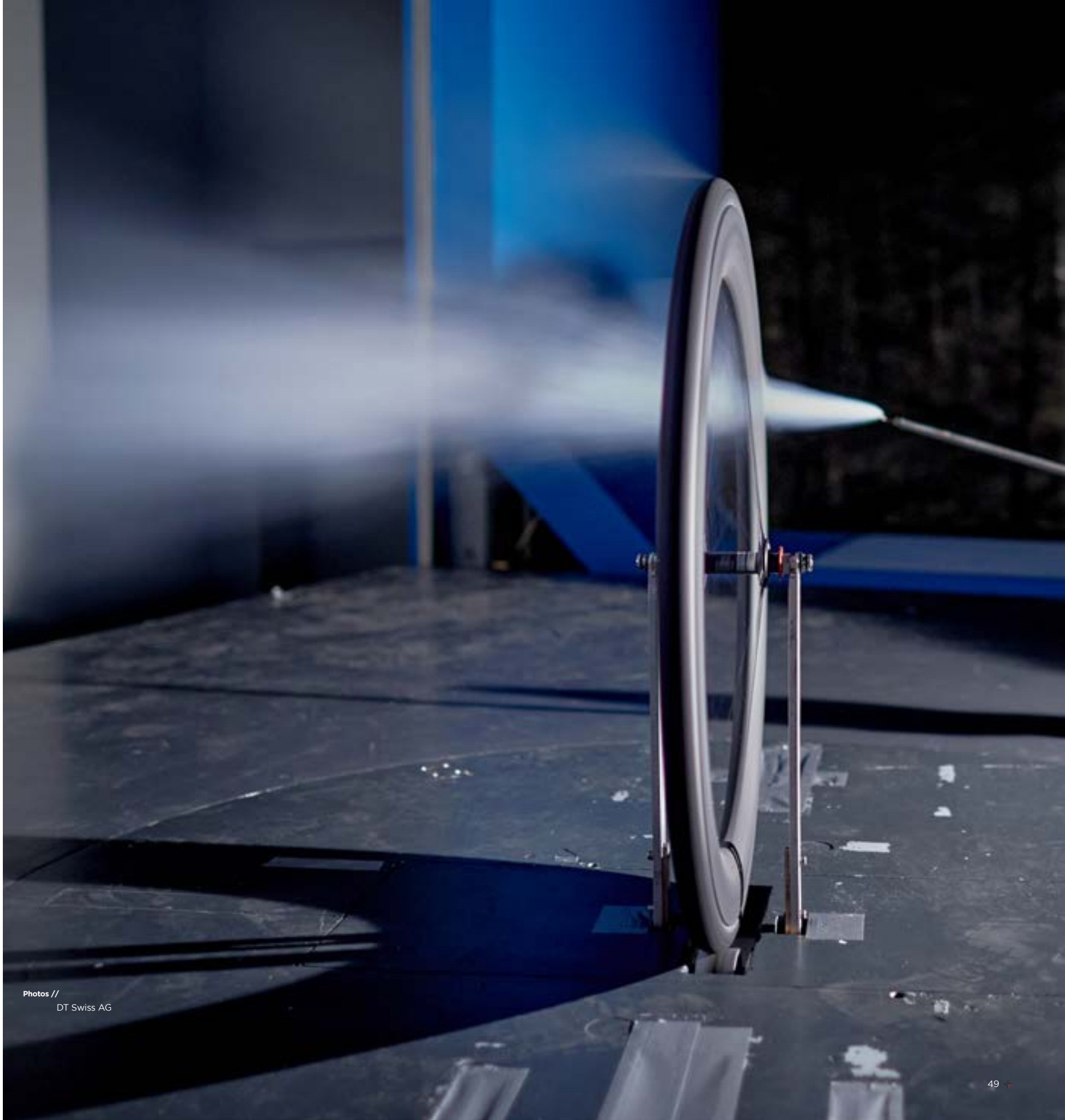


Wheels

Together with development partner DT Swiss, Swiss Side has developed the leading performance cycling wheels on the market today. With a focus on minimum drag, maximum sailing effect, without compromise on handling in the wind, and the highest possible quality. All components including the rims, hubs, spokes and even the spoke nipples are aerodynamically optimised for the best possible performance.



Photos //
DT Swiss AG



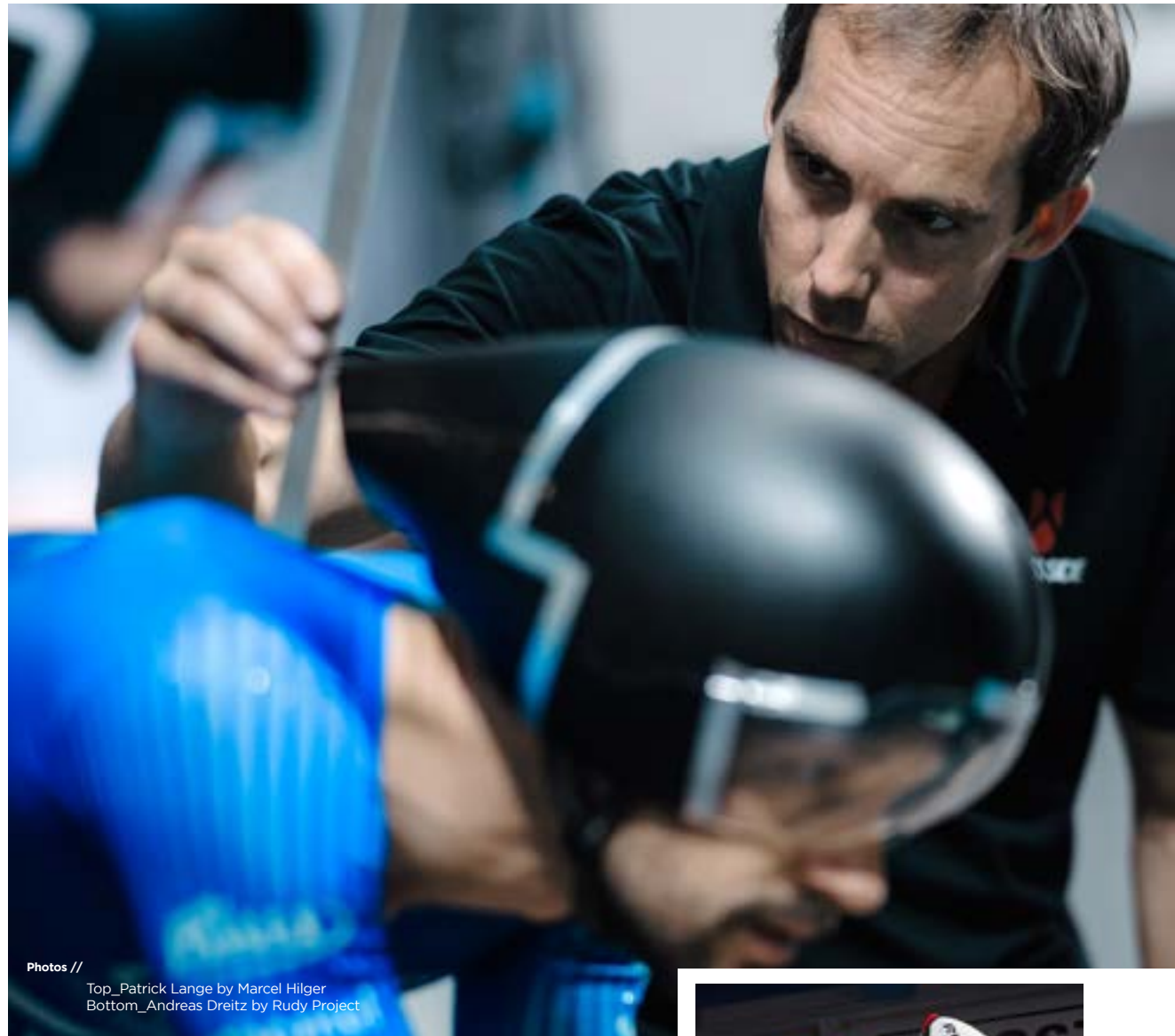
Race Suits

Aerodynamic textiles

An athlete's suit has a big impact on aerodynamic drag and the aero performance of a fabric can be measured. The optimum fabric and its orientation can then be defined for each particular body part, offering the best possible performance for an athlete's particular speed range. This can be seen on the suit created for Marcel Hug in collaboration with Swiss Side.



Photo // Marcel Hug by Schweizer Paraplegiker-Stiftung

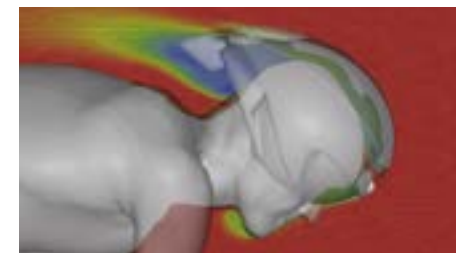


Photos // Top_Patrick Lange by Marcel Hilger
Bottom_Andreas Dreitz by Rudy Project

Helmets

Not just head protection

Swiss Side provides complete helmet development solutions for partners. A helmet's aerodynamic performance is not just limited to its external shape but also the internal airflow and the cooling efficiency. Swiss Side has developed special CFD and wind tunnel testing processes for developing helmets and measuring these important performance parameters.



Components

Aerodynamics meets ergonomics

Speed and reducing aerodynamic drag is not the only consideration. In endurance sports, improved ergonomics can deliver energy and time savings. Custom cockpit solutions create more stability and control on the bike and enable a more relaxed posture. This has been proven to result in faster bike splits and faster run times.



Photos // Patrick Lange by Marcel Hilger

Project 101

In 2018, Swiss Side, Canyon and Sauber Engineering collaborated on a project to shave 101 seconds off Patrick Lange's 2017 world record Kona Ironman time and to break the magic 8-hour barrier.

This resulted in an aerodynamically optimised, 3D printed titanium cockpit solution, and saw Patrick save not 101 seconds but an astonishing 7 min 21 sec, smashing his own world record with a new time of 07 h 52 min 39 sec.

Patrick was crowned the 2018 World Champion and the first person in the history of the Kona Ironman to go sub-8.

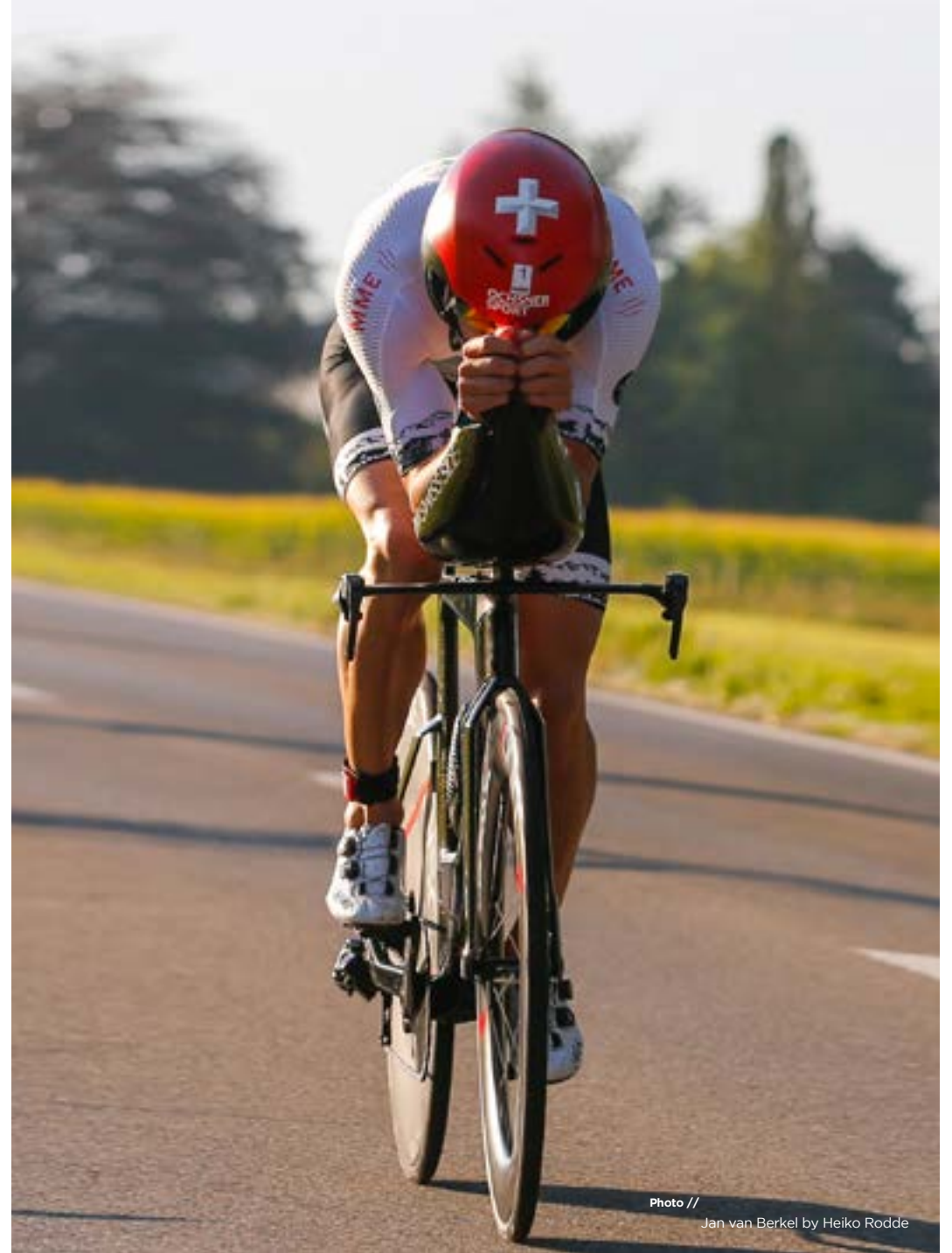


Photo // Jan van Berkel by Heiko Rodde

Jan van Berkel Cockpit

Swiss Side has continued to develop more advanced aerodynamic and ergonomic cockpit solutions.

In 2021, a new cockpit was unveiled for Jan van Berkel in his 'praying mantis' position. On its debut at the Ironman Tulsa, in difficult conditions, Jan went sub-8 for only the second time in his career, taking 2nd place overall and setting his fastest run time ever.

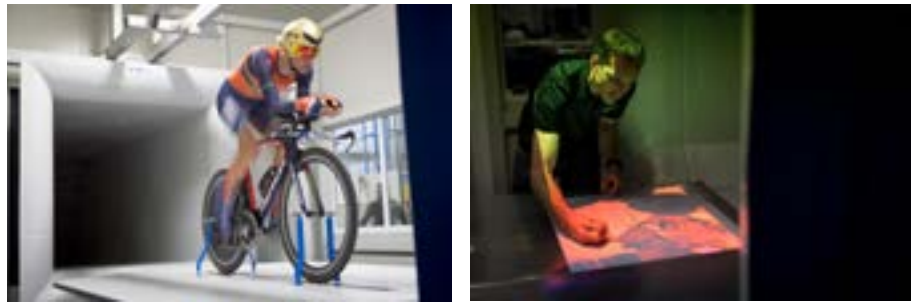


Pro Tour Cycling

The ultimate test

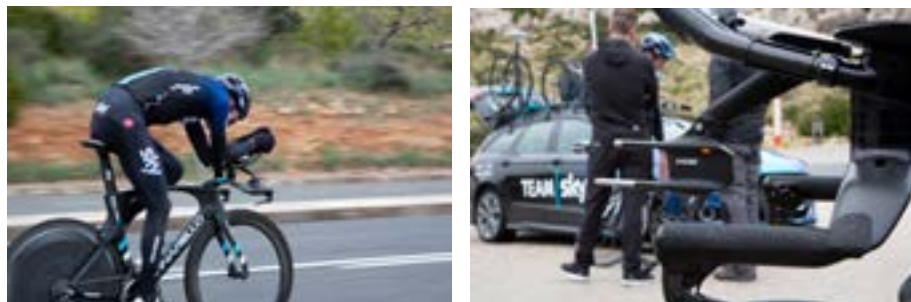
Since 2016, Swiss Side has offered its extensive expertise to a number of Pro Tour cycling teams, using every aspect of its unique know-how and the 4 Arm + 1 research and development process.

Formula 1 has well and truly reached the pinnacle of cycling.



Team Bahrain Merida

In the wind tunnel with Team Bahrain Merida, optimising equipment design, component choice and rider position.



Team Sky

On-road testing with the first generation of Swiss Side CdA-Meter devices.

Photos //
Top_ Team Bahrain Merida
Bottom_ Team Sky



Photos //
Team INEOS



Team INEOS

Swiss Side developed the 'Virtual Pitwall' platform to provide aerodynamic and race simulation support. This platform enables Team INEOS to develop optimal race strategies to maximise time gains in all race environments.

Team Swiss Side

Teamwork wins championships

A likeminded, innovative and driven team from diverse industries, all drawn together by a common goal to push the boundaries of understanding and technology, to make a difference for our future... and to have fun doing it!



Jörg
R&D Systems Engineering



Daniele
Head of Sales and Marketing



Jo
Accounting and Administration



Kristel
Logistics & Customer Service



Jean-Paul
CEO & Co-Founder



Seamus
Chief Research Officer



Nathalie
Bookkeeping



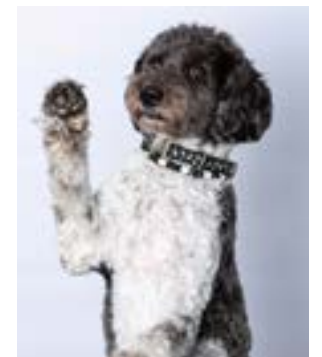
Steffi
Human Resources



Adrian
Aerodynamics & Design Engineering



Jónas
R&D Systems Engineering



Pixie
Aerodog

SwissSide.com



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Reflections:
future/present



Photo //

Michael Raelert by Ralf Graner Photodesign