



SHIMANO
WHEEL
TECHNOLOGY

SHIMANO

W H E E L

S Y S T E M S

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DURA-ACE

wheel development concepts

BLADE concept

Aerodynamics and stability



ACCELERATION

concept

Maximized driving efficiency



ACCELERATION concept

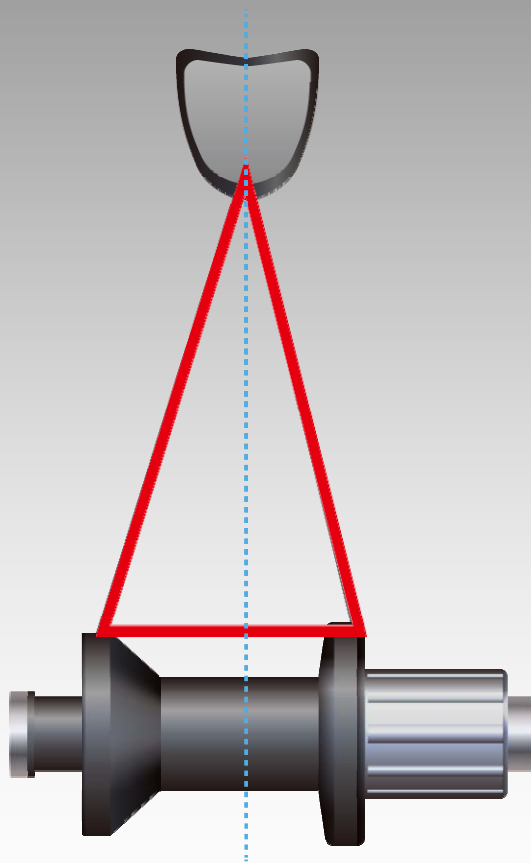


The ACCELERATION concept is an **evolution** of one the original **Dura-Ace** guiding principles of delivering the most **efficient drivetrain systems in the racing world** by improving **driving rigidity** that yields an amazing acceleration feeling. The Dura-Ace rim designs are **lighter weight, generate less inertia** all while maintaining stiffness.³

Wide Flange + Offset Rim

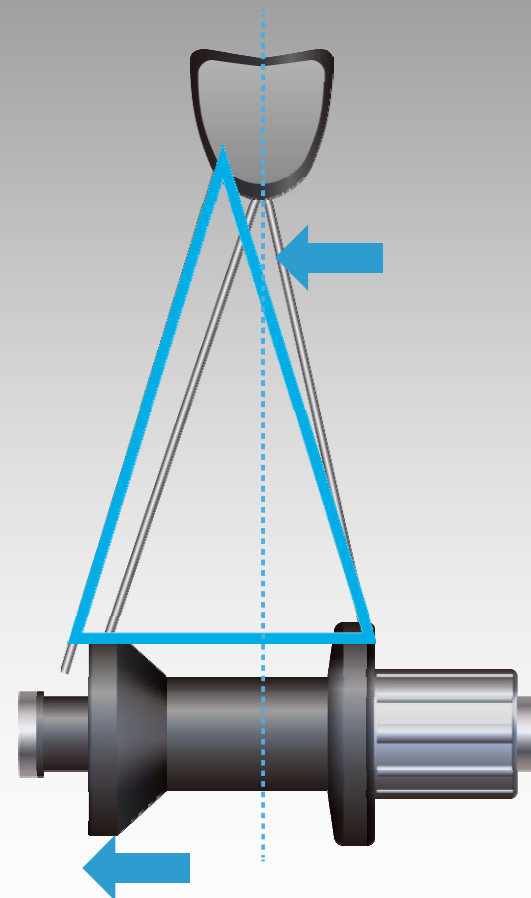
Wider triangulation with proper spoke balance

Unstable



Normal flange + symmetrical rim

Stable



Wide Flange + offset rim



Rim design strategy

Shimano's innovative rim design strategy starts with an extremely light basic rim structure and then adds the minimal elements necessary to reach durability standards. By beginning with an extremely light structure and then adding only the minimum necessary to achieve the required level of strength. SHIMANO wheels not only achieve exceptional lightness, stiffness and durability, but also an unmistakably superior ride quality.

Carbon rim construction

By optimizing materials, layup, curing and molding processes, SHIMANO carbon rims are built to be well balanced, strong, lightweight, durable and with an amazingly smooth braking track.

Ultra lightweight rims

C24	CL	F	359
		R	408
	TL	F	408
		R	431
C35	TU	F	397
		R	315
	CL	F	439
		R	440
C50	TU	F	408
		R	412
	CL	F	560
		R	576
C75	TU	F	471
		R	553

With no compromise to durability or required strength

- OptBal 21 spoke wheel features 14 spokes on the drive-side and 7 spokes on the non-drive.
- OptBal lacing balances spoke tension, enhancing wheel rigidity and improving durability.

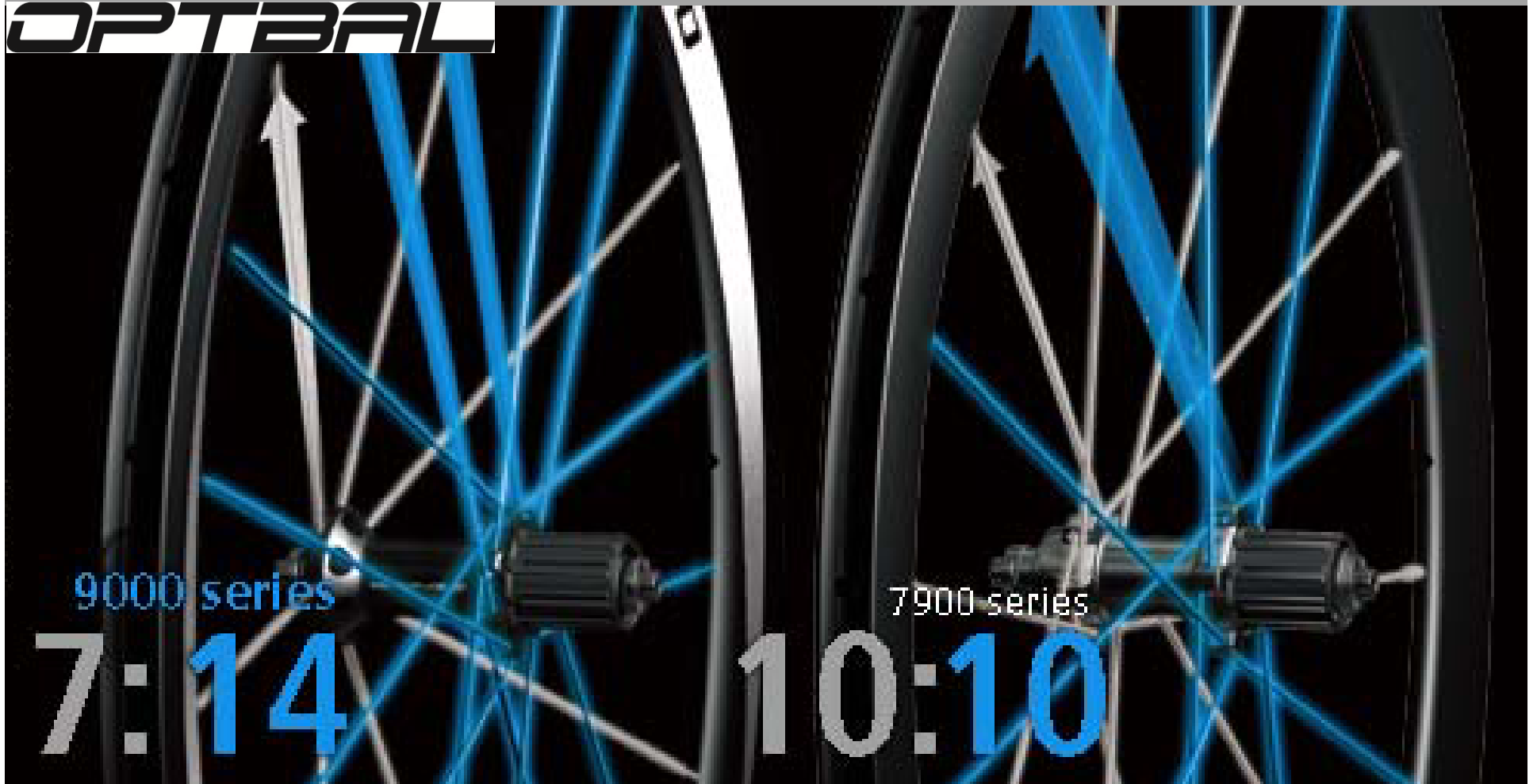
OPTBAL

9000 series

7:14

7900 series

10:10



ACCELERATION
concept

DURA-ACE

WH-9000-C24-CL Carbon Clincher

Maximized driving efficiency

Responsive acceleration, ultra-light carbon-alloy clincher

- Carbon laminate construction rim (~383g)
- Off-set rim with wide flange hub
- 2-cross tangent, straight laced spokes optimizes torsional rigidity
- 100% Ti FH body
- 1364g



ACCELERATION
concept

DURA-ACE

WH-9000-C24-TL Carbon Tubeless

Maximized driving efficiency

Technology enhanced performance

- Shimano Road Tubeless and tube compatible rim
- Carbon laminate construction rim (~420g)
- 2-cross tangent, straight laced spokes optimizes torsional rigidity
- Off-set rim with wide flange hub
- 100% Ti FH body
- 1454g



ACCELERATION concept

DURA-ACE

WH-9000-C35-CL Carbon Clincher Everyday reliability with race day performance

- Opt-Bal 2:1 lacing
- Carbon laminate rim construction
(~440g)
- 100% Ti FH body
- 1525g

Maximized driving efficiency



ACCELERATION
concept

DURA-ACE

WH-9000-C35-TU Carbon Tubular

Maximizing driving efficiency

The Pro-Tour's race day choice

- Opt-Bal 2:1 lacing
- 100% Carbon construction
- Off-set rim with extra wide flange hub (+7mm)
- 315g ultra-light rear rim
- 100% Ti FH body
- 1260g



ACCELERATION
concept

DURA-ACE


WH-9000-C24-TU Carbon Tubular

Maximizing driving efficiency

The Pro-Tour's race day

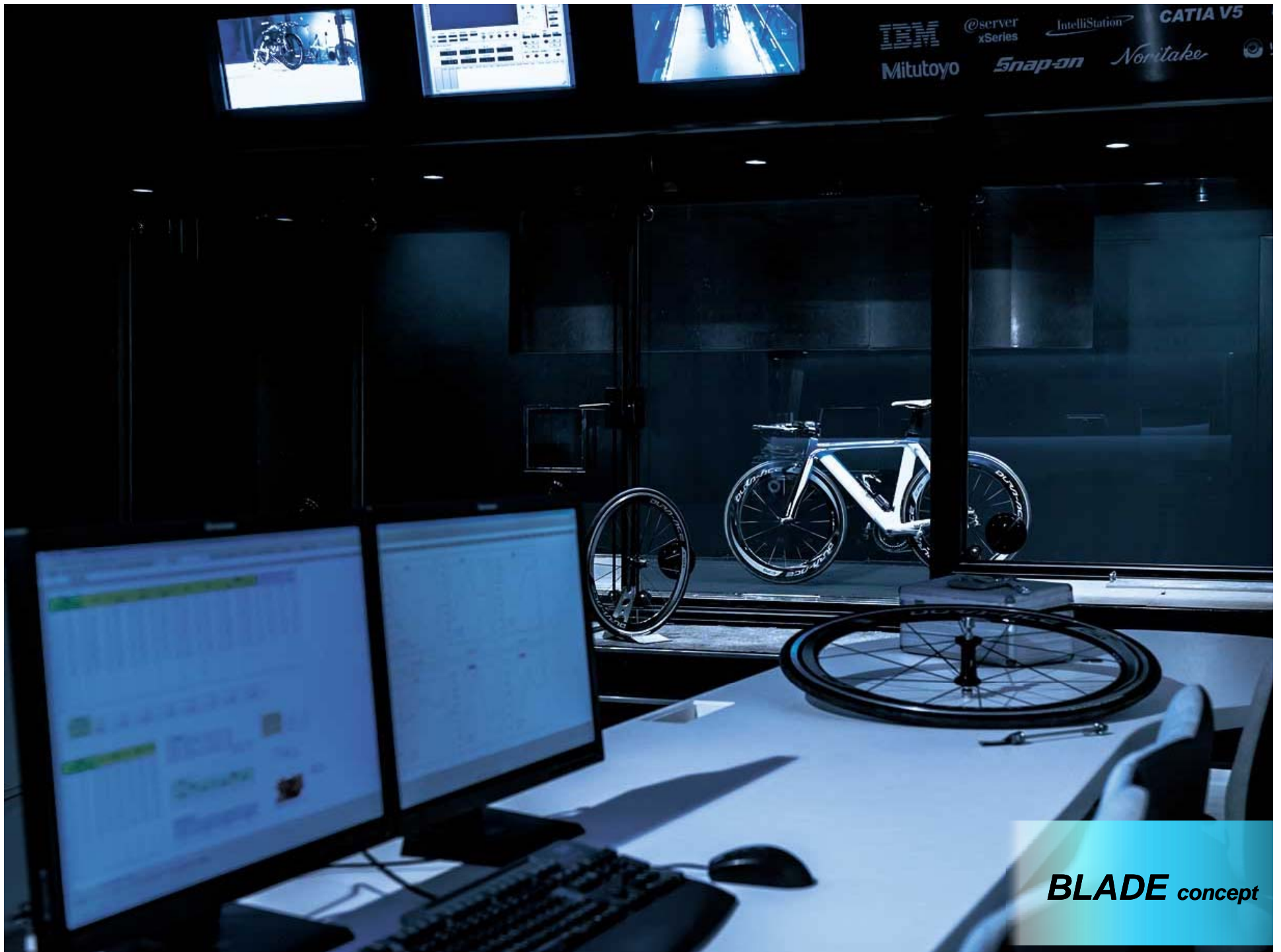
- Opt-Bal 2:1 lacing
- 100% Carbon construction
- Off-set rim with extra wide flange hub (+7mm)
- ~275g (est.) ultra-light rear rim
- Hybrid alloy/steel ball cone races
- 100% Ti FH body
- 1151g





The BLADE concept is Shimano's first fully committed effort to develop an aerodynamically superior wheel with two key guiding principles: engineered for speed and optimized aerodynamic performance. The new wheels are the result of countless hours in the wind tunnel and real world time trial and triathlete professionals' feedback and validation.

BLADE concept



BLADE concept

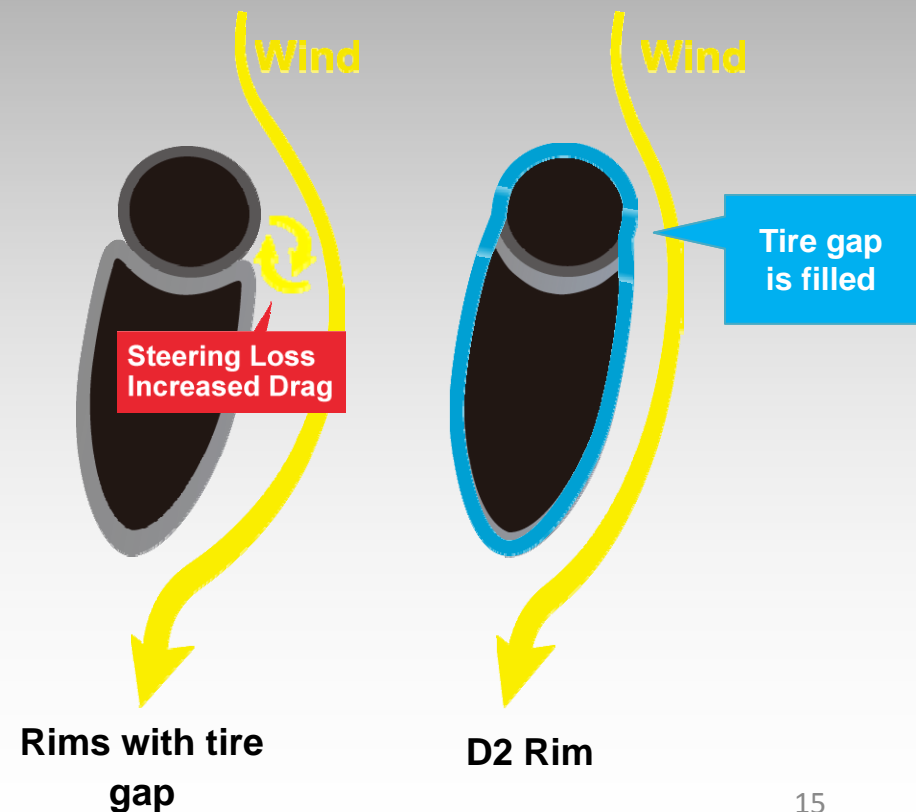
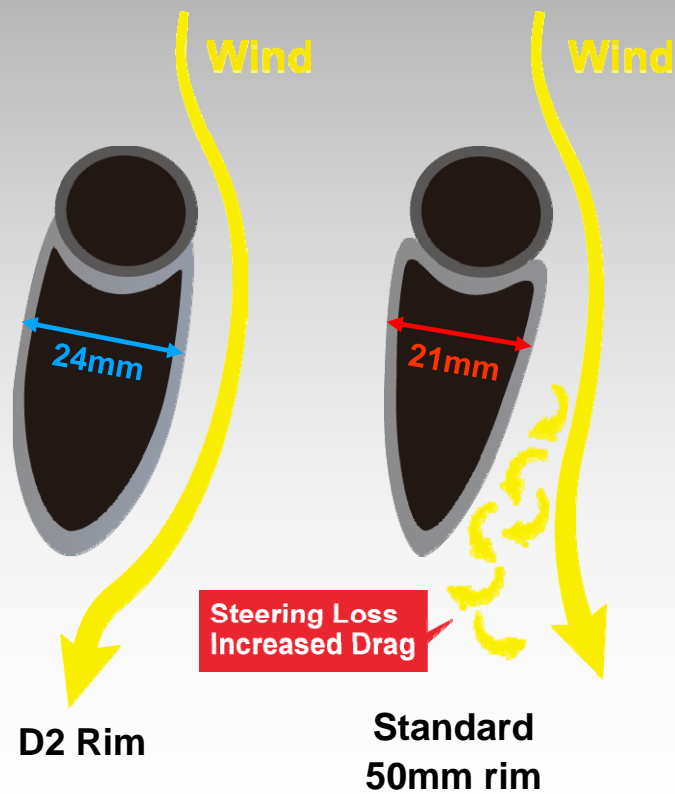
D2 Rim

BLADE concept

Balancing the benefits of an aerodynamic rim profile with the ability to be able to control the cross-wind effects was our engineer's primary objective.

Effective in lateral wind conditions

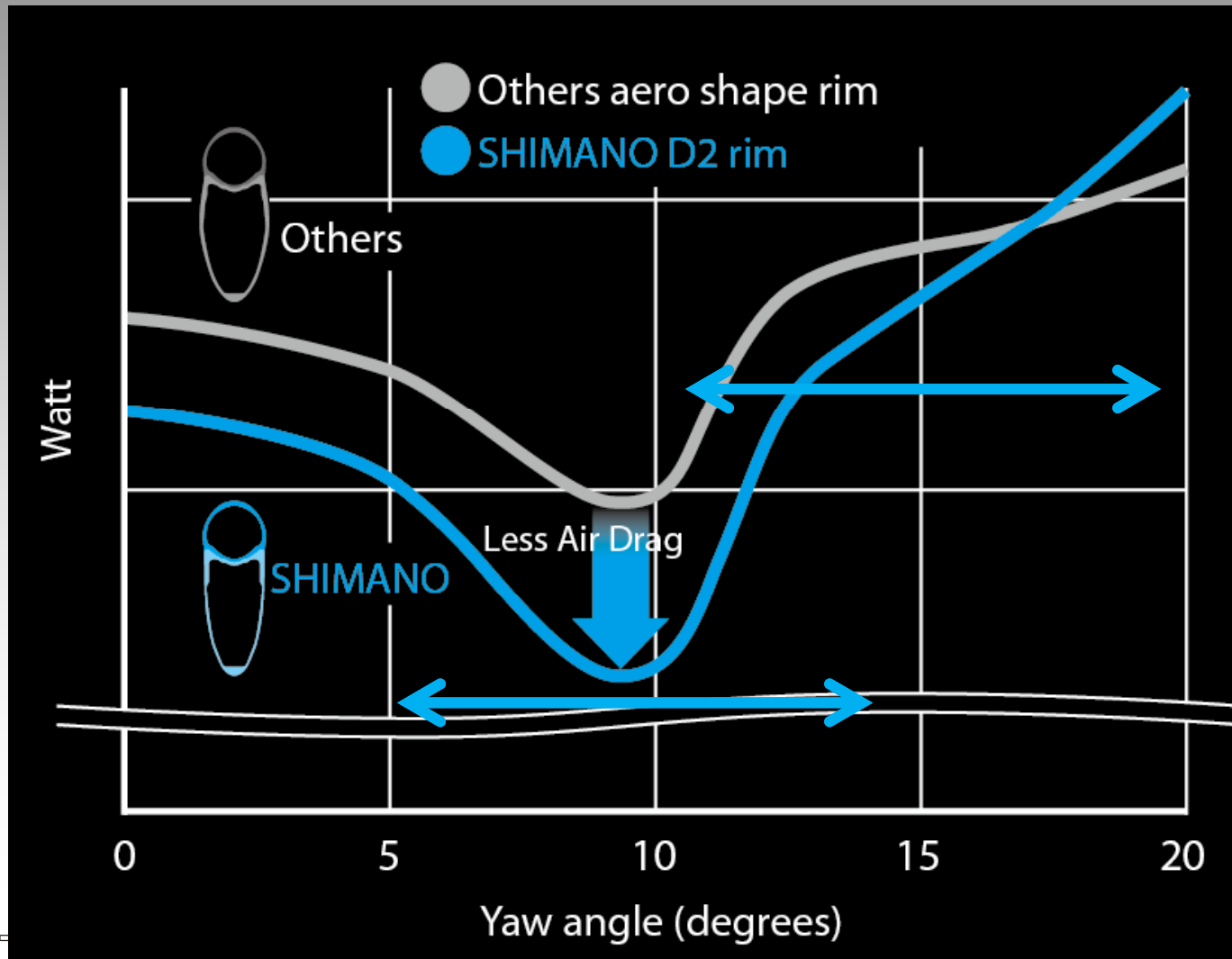
Smoother air flow



D2 rim

The D2 rim profile is most beneficial in typical bike/wind velocity and wind angle conditions (5~10° yaw angles)

Handling stability is maintained as yaw increases (+10 degrees)



DURA-ACE

BLADE concept

Aerodynamics and stability

WH-9000-C50-CL Carbon Clincher

Aerodynamic performance with the convenience of clinchers

- 23mm D2 rim profile
- Opt-Bal 2:1 lacing
- Carbon/Alloy construction
- Extra wide flange hub (+7mm)
- Hidden nipples
- 100% Ti FH body
- 1672g



DURA-ACE

BLADE concept

Aerodynamics and stability

WH-9000-C50-TU Carbon Tubular

For the performance driven Triathlete & Road Racer

- 24mm D2 rim profile
- Opt-Bal 2:1 lacing
- 100% High modulus carbon construction
- Extra wide flange hub (+7mm)
- Hidden nipples
- 100% Ti FH body
- 1449g



DURA-ACE

BLADE concept

Aerodynamics and stability

WH-9000-C75-TU Carbon Tubular

For the performance driven Triathlete & Road Racer

- 24mm D2 rim profile
- Opt-Bal 2:1 lacing
- 100% High modulus carbon construction
- Extra wide flange hub (+7mm)
- Hidden nipples
- 100% Ti FH body
- 1545g



DURA-ACE

Strong. Light. Aerodynamic. Hand-made.

Optimized for balance: durability, weight, lateral rigidity, driving and torsional rigidity and aerodynamics...because everything effects everything.

The D2 Rim is Shimano's first fully committed effort to develop an aerodynamically superior wheel.

OptBal spoke system features 21 spokes - 14 on the drive side and 7 on the non-drive side. This rebalances spoke tension which enhances wheel rigidity and strength.

Together with the Extra-Wide Flange – it delivers world-class torsional and lateral rigidity and boosted power-transfer efficiency

Shimano wheel-sets are manually crafted 100% in-house.

Designed to produce the ultimate ride experience.

Ride on!