

FlowForce - Smarter Paddling

Harness More Power. Paddle More Efficiently. Upgrade Your Performance.

FlowForce is the next step in paddle technology – a hydrodynamically advanced blade that delivers more drive, less drag, and improved stroke stability.

Traditional Paddles

Conventional blades generate high-pressure drag, with wake turbulence and vortex formation that waste energy. This means your shoulders, arms, and core work harder than they need to for the propulsion you get.

The FlowForce Solution

Our patented blade design incorporates precision-cuts or slits that allow some water to pass through the paddle. This:

- Reduces peak pressure at the catch and throughout the drive phase
- Improves energy transfer by minimising drag and wake turbulence
- Stabilises blade movement in the water
- Delivers higher stroke efficiency with less physiological cost

Backed by Science

- The slits promote controlled flow, reducing wasted energy forming vortices and turbulence.
- CFD simulations and field testing confirm that paddlers expend less energy per metre travelled.
- Peak force on joints is reduced, lowering injury risk without compromising forward propulsion.

Real-World Performance Gains

Endurance athletes report increased average speeds, reduced fatigue, and better recovery after long-distance paddles.

“It feels like the blade locks in better with less effort. More drive, less fight.”

FlowForce isn't just about comfort – it's about performance. It's the paddle that gives back what you put in. The one that helps you go farther, faster, and smarter.

FlowForce is available now across SUP, kayak, canoe, Dragon and OC paddles.

The Science Behind FlowForce Blades – A bit more detail

The physics behind slit blade technology revolves around fluid dynamics, pressure differentials, and drag vs. lift forces. This explanation will walk you through the key concepts and equations that explain how and why slit blades enhance propulsion and efficiency.

Fundamental Principles

One of the core principles at play is Bernoulli's Principle, which explains how fluid pressure changes with velocity. It's a fundamental concept in fluid dynamics that describes how the pressure of a fluid decreases as its velocity increases.

In slit blades the water flowing through the slits speeds up due to the narrow openings. This reduces pressure on the back of the blade. As a result, the pressure difference between the front and back of the blade increases, which boosts the driving force that propels you forward.

Pressure Differential & Propulsive Force

The net force generated by the paddle (excluding handle force) comes from the pressure difference across the blade:

Slits help stabilise the low-pressure region on the back of the blade. Efficient blade design (like FlowForce slit blades) can reduce the handle force required to generate the same or greater forward propulsion—meaning less fatigue and more speed.

Driving Force

This is the actual physical force that pushes you forward over the water. It results from the pressure difference between the front and back of the blade during the stroke. That difference in pressure equals driving force, which pushes you forward.

Lift and Drag Forces

Blades create both drag and lift forces, especially at shallow angles of attack (e.g., 0°–45° during the early drive).

Hydrodynamic Lift:

Lift is generated by angled blades moving through water. It's a dimensionless number that describes how efficiently the blade generates lift compared to its size and the fluid speed. A higher Lift Coefficient means more lift (driving force) for the same speed and blade area. It doesn't directly measure force, but it's part of the equation that leads to the force. You could think of it as a measure of how well the blade converts water flow into useful driving force.

Hydrodynamic Drag:

In paddle sports, you need resistance to generate forward motion. That resistance is, essentially, drag — specifically form drag — which helps create the pressure difference between the front and back of the blade.

At the catch (when the blade enters the water), drag pushes back against the blade. This creates high pressure in front of the blade. Behind the blade, the water moves away, forming low pressure. In this way, some drag is necessary — it gives the blade something to push against, like traction.

But not all drag is helpful. There are types of drag that waste energy. Excess Form Drag, Wave Drag caused by the blade creating surface waves and Turbulence / Wake Drag behind a solid blade, swirling vortices form. This turbulent wake saps your energy without helping you move.

Effect of Slits on Lift and Drag

- Drag Reduction: Slits reduce unproductive drag by allowing flow-through, which minimises turbulent wake and vortex shedding behind the blade.
- Lift Stability: Slits help maintain flow attachment and stabilise the low-pressure region behind the blade, leading to more consistent and efficient propulsion.

FlowForce blades reduce unproductive drag and turbulence, they increase the proportion of input energy that results in forward propulsion.

Vortex Shedding and Wake Loss

Without slits, a paddle blade generates strong trailing vortices (swirling water behind the blade), which are a major source of form drag and energy loss.

CFD simulations and physical testing show:

- Vortex strength and wake width are significantly reduced with slit blades.
- Lower turbulent kinetic energy in the wake means less wasted energy and a more efficient transfer of force.

Why Handle Force Matters:

Handle force is the force that the paddler applies to the paddle shaft during each stroke. It's the input force generated by the athlete's body—through their arms, legs, and core—and transmitted through the shaft to the blade, which then interacts with the water. It determines how much physical effort the athlete is putting in.

Efficient blade design (like FlowForce slit blades) can reduce the handle force required to generate the same forward propulsion—meaning less fatigue and more efficient driving force.

<https://oscarpropulsion.com/sport/>

