

## The Technology of Cut Blades in Dragon Boat Paddle Design



The development of cut blade technology in Dragon Boat paddle design represents a significant advancement to injury prevention. Incorporating strategic cuts or slits into paddle blades can enhance hydrodynamic performance, increase efficiency, resulting in a reduction in physical strain on users. This technology has been backed by scientific research and validated through user feedback.

An application to the IDBF for approval of this technology to be used in racing was made in May 2023.

### Hydrodynamic Efficiency

#### Reduced Drag and Turbulence

One of the primary benefits of cut blades is their ability to reduce drag and turbulence. Traditional solid blades can create significant resistance when moving through the water, requiring more effort from the paddler. Cuts allow water to pass through the blade, minimising the formation of vortices and turbulence behind the blade. This results in a smoother and more stable flow of water, reducing drag and making each stroke more efficient.

#### Enhanced Flow Dynamics

The cuts help manage water flow around the blade more effectively. By allowing controlled passage of water, the blade maintains a high-pressure difference between the front and back surfaces, which is crucial for generating driving force. This optimised flow dynamics ensure that the paddle moves through the water with minimal resistance.

## Reduced Physiological Impact

### Lower Muscle Strain

The reduced drag and optimised flow dynamics of cut blades translate to lower physical strain on the paddler.

Traditional blades can exert significant pressure on the shoulders, back, elbows, and wrists. The paddling movement requires the dragon boater to twist to one side repeatedly. This can lead to an imbalance in flexibility and strength placing high loads on these various joints, in particular the lower back and the shoulder of the inner arm, thus making them the most vulnerable to overuse injury.

Cut blades distribute forces more evenly and reduce peak pressures, easing the workload on the muscles and joints.

## Improved Control and Stability

### Balanced Force Distribution

The cuts in the blades help in distributing the forces acting on the paddle more evenly. This balance reduces the likelihood of fluttering and instability during strokes, providing a smoother and more controlled paddling experience.

## Practical and User-Validated Benefits

### Positive User Feedback

Real-world testing and user feedback have overwhelmingly supported the benefits of cut blade technology. Paddlers from various backgrounds, including recreational users and competitive athletes, have reported significant improvements in efficiency and comfort. Users have noted less fatigue and reduced muscle strain making cut blades a preferred choice for many.

## Conclusion

Cut blade technology represents a major innovation in Dragon Boat paddle design, offering numerous benefits that improve hydrodynamic efficiency and reduce physiological impact. Backed by scientific research and validated by user feedback, cut blades ensure comfort and reduce the risk of injury. As this technology continues to evolve, it holds the potential to become a standard in the sport, offering paddlers of all levels a safer and more enjoyable experience on the water.

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## Quotes

### UK Club paddlers

“Your paddles seemed softer at the catch / start, were easier to keep going as the pieces went on.”

“I tried it out in a single today against my original paddle and surprisingly I'm getting roughly the same speed. I was expecting it to be slightly less as the loading on the blade seems a lot less. The rate is slightly higher probably again because of the less loading on the blade through the water.”

“Less effort is required at the catch to make an effective catch. Normally, the catch has to be made with an aggressive downward drive from the inboard shoulder. With the new design, the catch can be made less aggressively.”

“Having made the catch, it remains in place throughout the power phase of the stroke”

“With a less aggressive catch, there has to be benefits in terms of the reduction of shoulder injuries in the long term. This paddle could be beneficial for new paddlers, older paddlers and those recovering from shoulder injuries.”

“I found your new one meant I was having to put less push down on the catch. So less strain was going into the physio braces I wear on my arms to now try and prevent/minimise tennis elbow issues I have”

### GB premier open paddler

“I found that the paddles offered immediately noticeable benefits during our session:

Less fatigue. Despite it being a long session, I felt fairly fresh throughout.

Less sore shoulder/back - despite paddling for an hour on one side, my shoulder did not ache at the end like it has done doing these sessions in the past.

Also, my back did not ache once we had finished. This could be because the loading of the paddle at the front end felt natural and less forceful”

### Hong Kong Dragon Boater

“There must have been a big reason behind this new paddle. Thought it will be good for paddling long-distance, posture correction, newbie or physiotherapy. The blade is light and easy to use.”

## **Peter Kruszelnicki – Letter to the IDBF**

“I would like to say a few words on the benefits my club has gained using the slit paddles. I’m an experienced dragon boat paddler, a coach at my club and have represented Great Britain in Dragon Boat international events for over 10 years.

Our club was given 5 slit paddles about a year and a half ago and although the trial was not compulsory, several of our paddlers now use them on a permanent basis. I would say that our older paddlers and those with shoulder injuries seem to have benefited the most.

From our experience there doesn’t seem to be any speed enhancement or performance benefit from them. In fact we have found very minimal difference in time trials which we find interesting. However what we have found is the power curve in each stroke is more spread over the stroke rather than just at the front. The stroke feels less of a heavy impact at the front but gives a much more even load throughout the stroke. It certainly eases those with shoulder weakness but still gives them the benefit of a power, albeit through the whole stroke. I can’t say for sure if these paddles have helped some of our paddlers with injuries continue the sport but it has certainly helped them tremendously.”

## **Ian Bowers – GB Grands paddler and coach**

“Duncan Troy from Oscar Propulsion has asked me to provide some input on the slit dragon boat paddle that he is seeking to obtain IDBF approval for. Several members of my club, Wraysbury Dragons in the UK, tested these paddles over a period of time - a number of these paddlers are very experienced GB paddlers, myself included. Feedback was provided to Duncan via a survey.

The slit paddle was found to be no faster than a standard paddle. The big advantage to the slit paddle is that it is less stressful on the shoulder. It would be suitable for juniors to use, new paddlers and to those paddlers recovering from shoulder injury. Long term use of this type of paddle would presumably reduce shoulder injuries.”

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