Shape optimization with integration of the system ADAC.

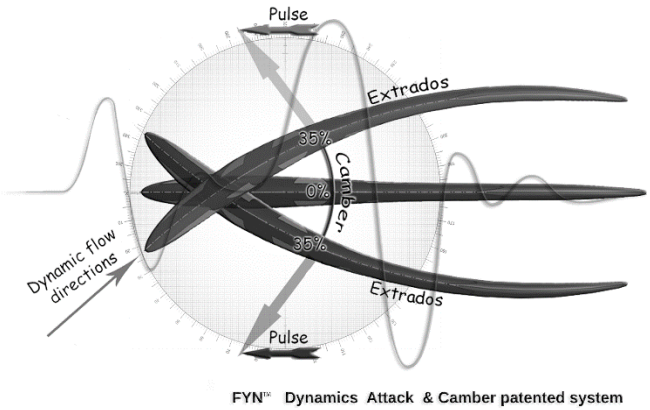
The hand of the shaper condenses intuitive surfing, by including its trajectories in shape. Although the plane and saw are sometimes replaced with CNC machining centers, the shaper's vision remains irreplaceable. The art of a new shape mixing technique and inspiration, without clear boundary, but the vision of talented shaper is always supported by the mastery of physical and hydrodynamic phenomena. Recognizing this imperative, therefore, provides FYN here, integration levers ADAC system for the innovative realization of exceptional surf.

Marine, and human factors are alive and dynamic**.**

Adaptation is the instinct of surfing.

The Genome FYN result of this instinct, it activates its natural logic of dynamic adaptation, at the heart of your Shapes.

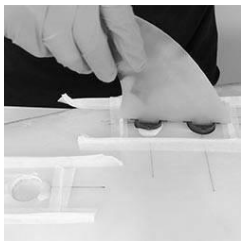
The system ADAC (Adaptive Dynamics Attack & Camber. System patented) offers unprecedented integration strategy of the fins and lift depending on the desired dynamic character. The adaptable self variable geometry system ADAC frees the shaper from constraints of fins implantation. Opening the way to an unprecedented optimization of the automatic management of forces, FYN fins increase the freedom and creativity of shape.



FYN™ Dynamics Attack & Camber patented system

Currently compatible with the bases FCS / Future / US box, the ADAC technology is adaptable to professional surfing, motivated by integration GENOME FYN in surfing DNA. If you want to integrate the concept of ADAC FYN in original boxes for your brand:

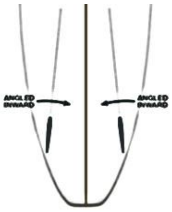
Contact FYN team that strives to secure the earliest compatibility with your brand to avoid any effects of exclusive monopolies: _contact@fynsurf.com_



The implementation of the fins must highlight the work of the outline, the tail and rail to generate healthy and natural maneuvers. This delicate phase is decisive for the final dynamics of the board, if the angles are inadequate, or if the formula used diverges from the Shape, the entire work of the shaper may be affected. FYN is particularly focused on this key point, which is a pillar of the success of integrating Shapes ADAC system. Adaptive dynamics introduced a "living" fin providing a logical, revealing that of the shape! So here's how the animal logic FYN, naturally attaches to the intuition of the shaper:

- **<u>Impact of the ADAC system on the toe angle / splay and antagonist symmetrical side fins arched</u>**:

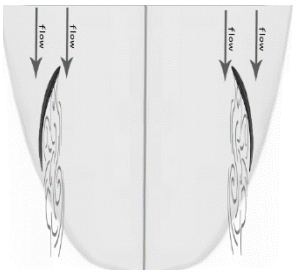
Typically, the angle of toe generates maneuverability and decale the stall in radical maneuvers by reducing the apparent angle of incidence in the trajectory curves. A profile with arched top surface in the direction of the desired lift increases unquestionably support, but also involves an antagonistic symmetry of side fins



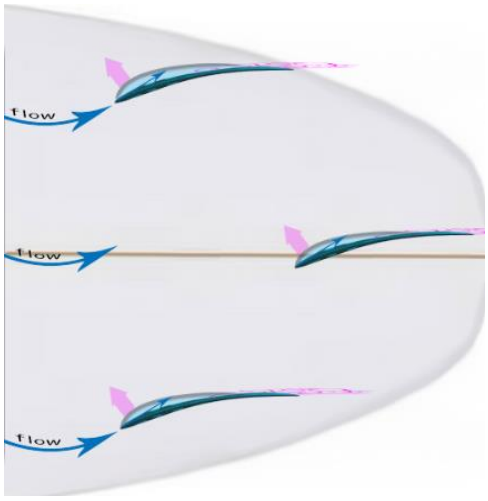
For further study:

- « *dynamique et hydro dynamique de l'aileron* » *https://youtu.be/VOe1Qyo9L-o*
- *Additional hydrodynamic data at end of document*

These angle antagonisms and static camber unfortunately induce drag and the need to release the antagonist fin water to clean maneuvers. But in reality the thrusters retain their three fins in water at 90% of the time and centreboard 99.9% of the time. It is almost impossible to find a photo or video showing the central fin not submerged even in tube type ultra-rapid phases.



The dynamic adjustment of the angle of attack and camber of FYN fins, suppress harmful antagonism and increase the positive effects of camber and the angle of incidence by adapting the camber and angle of all fins along the dynamic path of the surfer.



If your traditional Shape has an angle of "toe" that is not catastrophic, because the angles of the fins FYN will adapt naturally, but it is preferable to maintain a parallel implementation alignment, with the axis of the board.

FYN recommends to not set any toe angle, because the ADAC system adapts dynamically.

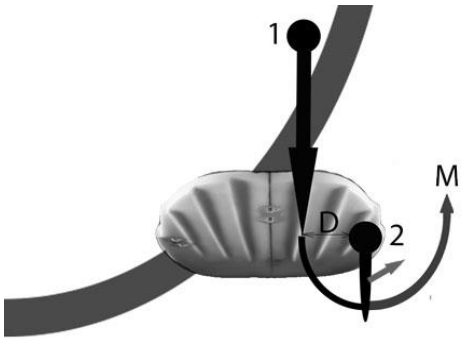
This resolution of the strain antagonistic symmetry of camber and toe angle induces a questioning of the need for bilateral positioning of fins and involves positioning strategy consequences completely new ...

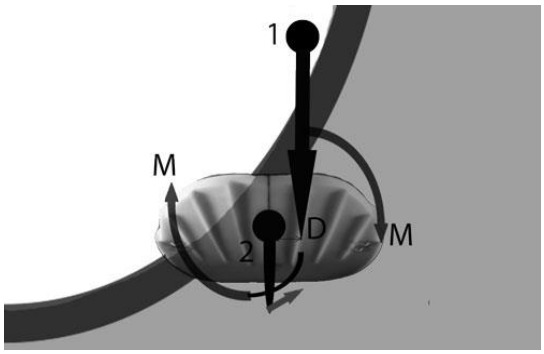
- **<u>Configurations and positions "bilateral" (twins, thrusters, quad, bonzer…)</u>**

The ADAC system, freed the SHAPER of "bilateral symmetry antagonist" solution constraining to compromise. If we adopt an optimization strategy without compromise, it leads to the conclusion: ***1 good central fin is better than 2 lateral that contradict!***

The question of the effectiveness of the proximity of the fin and rail becomes predominant to assess the need to maintain a "bilateral" configuration, even with dynamic fins FYN.

Recall that the thrusters retain their centerboard immersed 99.9% of the time and he is almost impossible to find a photo or video center fin not submerged even in the fastest stages surfed by pros! Let's see in detail the positioning of forces and their influence on the hanging of the rail:





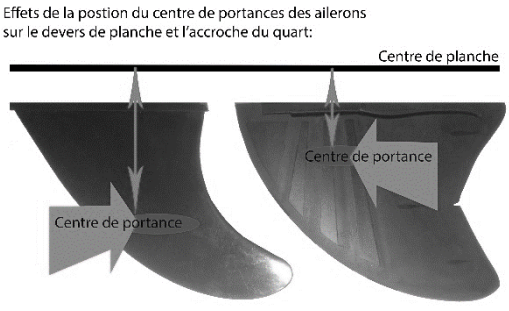
<u>near of the rail configuration:</u>
The center of gravity (1) is applied at a distance (D) of the drift center (2) in a direction away from the rail. This generates a torque (M) tending to dump the board and reduce the support of the rail sought by the surfer …

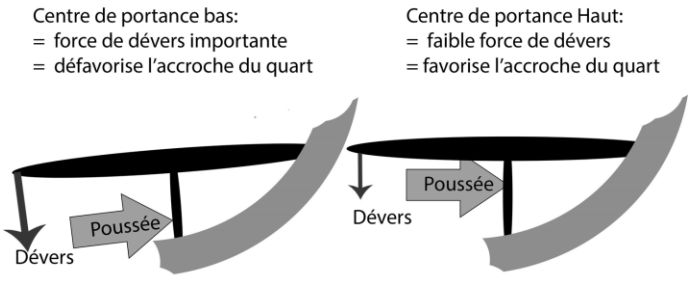
<u>Configuration: Fin centered:</u>
The center of gravity (1) applied at a distance (D) of the drift center (2) in a direction approaching the rail. This generates a torque (M) **naturally increasing the support of the rail sought by the surfer**

The facts established by FYN, and ADAC system developers, therefore, is that: **If the camber and incidence are dynamic,** *bilateral wing configuration is no longer necessary, and* ***worse than the central position*****.** Some surfers have never wanted to go to the multi-sides fins for these reasons.

We also note that the dynamics of FIN fins is independent of the elongation, this releases excessive elongation and allows a wing area, lift up the center towards the board to limit its tilt :

Cumulation: center position, + ascended center of lift, thus offer optimum grip of rail to the surfer.

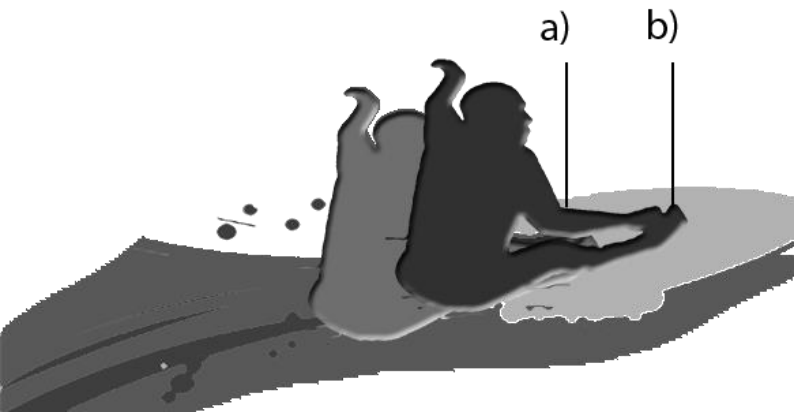




- **<u>Longitudinal position and optimization of dynamic pivot on the rider's center of gravity:</u>**

When the leading edge of the ADAC system rotates, he leads the force grip, towards the front, but also the theoretical pivot axis of the "Body & board surfer." This repositioning of the center of rotation induces variety of effects including:

- A surf more often presses on the fast flat area of the board.
- fast combos maneuvers with less transfer position front / rear.
- More instinctive lateral movement giving the impression that the board "sticks to the feet"

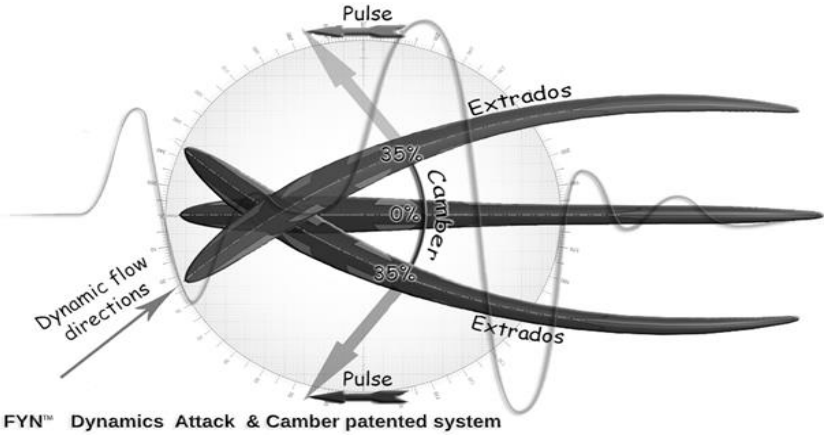


<u>What changes</u>: Disappearance of the rotation center blocking the back foot (position), slowing in the manner of a skid of conventional static fin. The propulsive sweep released back foot, provides acceleration for each maneuver. Freedom of maneuver provided by the advanced position (b), and the "cut" path, operates the curve of the rocker / Rail generating speed and accuracy The position of the overall center of rotation balanced on the spine and the flat of the board, is one of instinctive effects of ADAC system!

- **<u>accelerator lever from pulsation.</u> • The combination of the two dimensions of the pumping movement generates a "animal" style from the surfer. It is a strong marker of style induced by ADAC:**

It is known that short boards lend themselves well to the pumping maneuvers. If your shape is of type Short / Hybrid / Evolutionary / Fish, it will fully benefit from the effect of acceleration produced by horizontal corrugations on the ADAC system (in the manner of a caudal fin, see video test side pulsation measures:http://www.mecaflux.com/videos/explication%20ailerons%20derives%20de%20surf%20dynamique%20v3.mp4). This exceptional given to boards, provides a true accelerator, propelling the rider to each maneuver.

The conventional pumping maneuver is highly vertical component, involving movement can degrade the fluidity of the trajectory and the wave, while the horizontal instinctive pulsations, operated by the ADAC system, are marine nature ripples. The shaper will introduce his customer surfer, towards the optimization of this new accelerator lever, fully exploiting the horizontal component of the pumping ripple.



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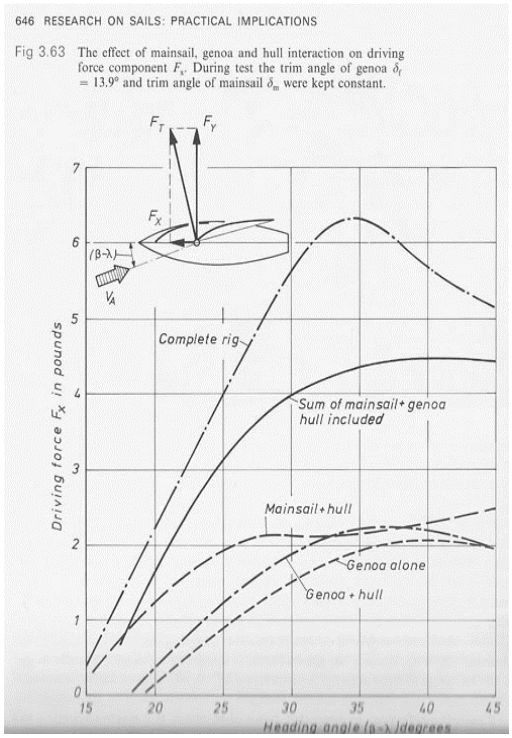
Cant angle :

If you want a thruster type of bilateral configuration or quad or twin, you can put them 7-8 ° cant commonly applied, but this setting is neutral for FYN type fins, because they all work together by adaptation, so you can stay perpendicular, because the possible effect of the cant to one side is offset by the opposite side.

Fyn therefore recommended to have a fin perpendicular to the surface of the board ***(angle cant= 0°)***

- **Towards the configuration « FYN line » :**
- We saw that a central position of the fin is more efficient and healthy level of balance and support. However, the modular multi-fins are still valuable because it remains useful and effective to adjust the overall supporting fins area. Thus allowing to increase, forward or back the support pivot by harmonizing the various surfaces of fins.

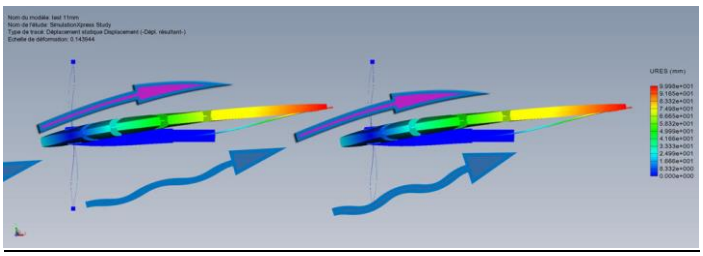


overall performance and a separate system mainsail genoa (Source: Aero-Hydrodynamics of sailing Marchaj)

- Self incidence of the wing of the ADAC system can benefit from a unique asset: This is the leading edge flap effect, or "headsail" which increases the performance of a set of several online profiles with respect to the flow direction.

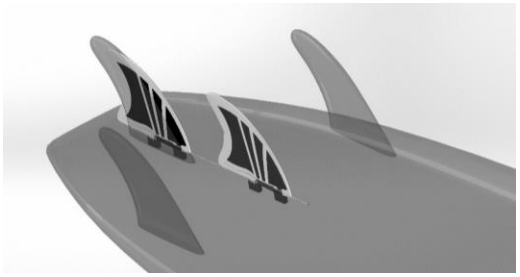
Sailing enthusiasts are familiar with this phenomenon when one tends the jib that injects compressed air stream on the edge of the mainsail, and generates an overall lift gain giving a superior result to the sum separate performance.

(1+1) > 2 !



Synchronization angles of attack and camber of the FYN ADAC system over two dynamics fins online

In 2016 FYN therefore introduced the concept of Configuration « FYN line », which involves implanting fins online (2 or 3) to benefit from the effects of trim tabs + better rail support. It is reserved for narrow boards and fluid surfing style without angles rolling the central part of the board from the water***.***

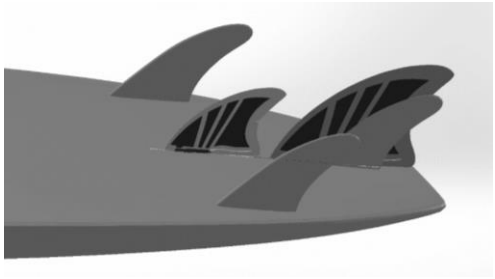


-***Short/Hybrid/Evolutive/Fish*** :

If the surface of a fin is insufficient for the type of board and / or weight of the surfer use 2 Genomes models FYN alignment with the trailing edge of the upstream fin 40 mm minimum from the front (leading edge) the other Genome. Centered on the board.

<= Comparison of fins settlements positions FYN dynamic / static fin =>

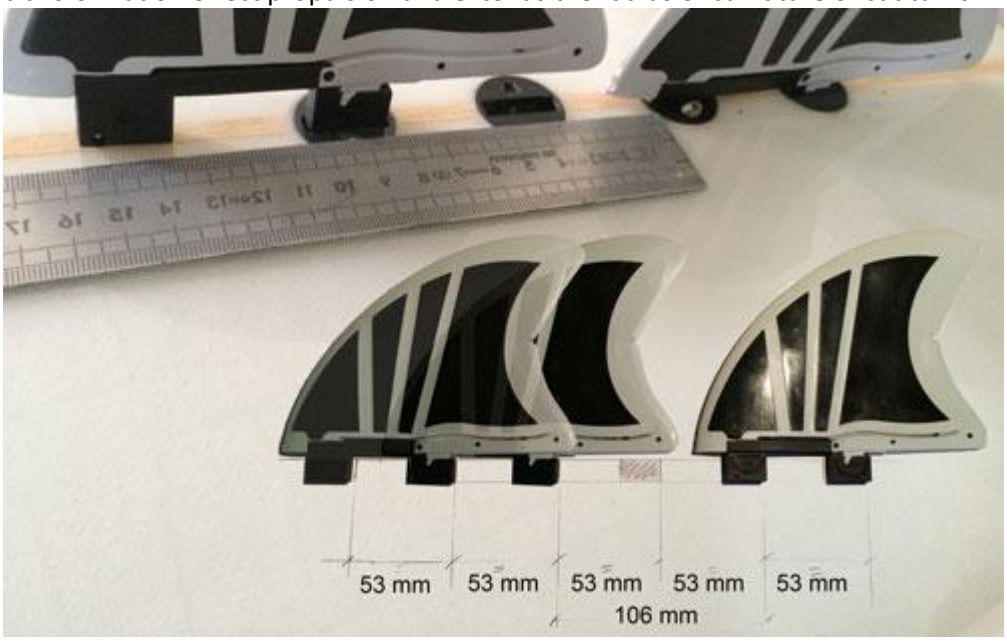
- ***Long Board/ paddle :***



If the surface of a fin is insufficient for the type of board and / or weight of the surfer use a long Genome Board model back position, trailing edge 40 mm from the back of the board around, and (optionally for an increase in the pulsating effect and lift) a Genome Standard, with the trailing edge of about 80 mm from the edge of the Genome longboard.

Bases of the FYN configuration setting in line:

- positioning the assembly forward, makes it more maneuverable surfing
- Increasing the space between two fins increases the pumping horizontal corrugations transformation effect propulsion and extends the radius of curvature of cut turns.



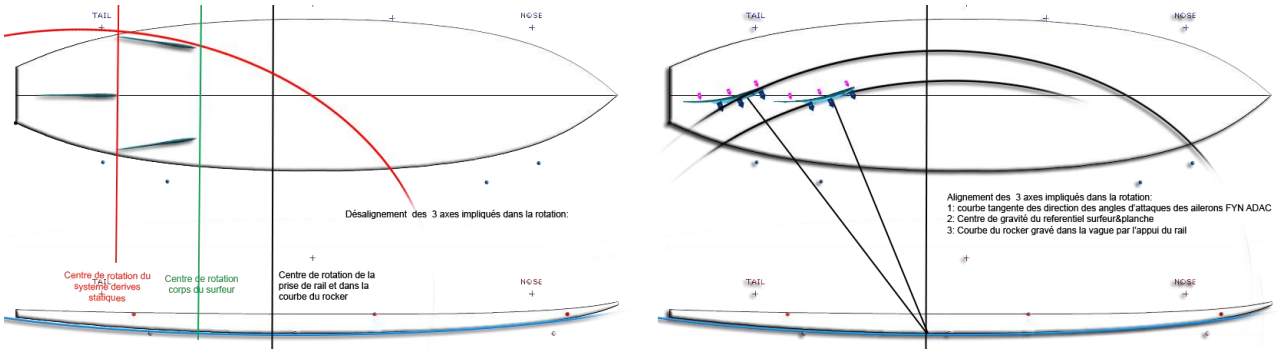
The idea for the longitudinal optimal positioning, is to focus all actors of the rotation in the natural equilibrium of the surfer

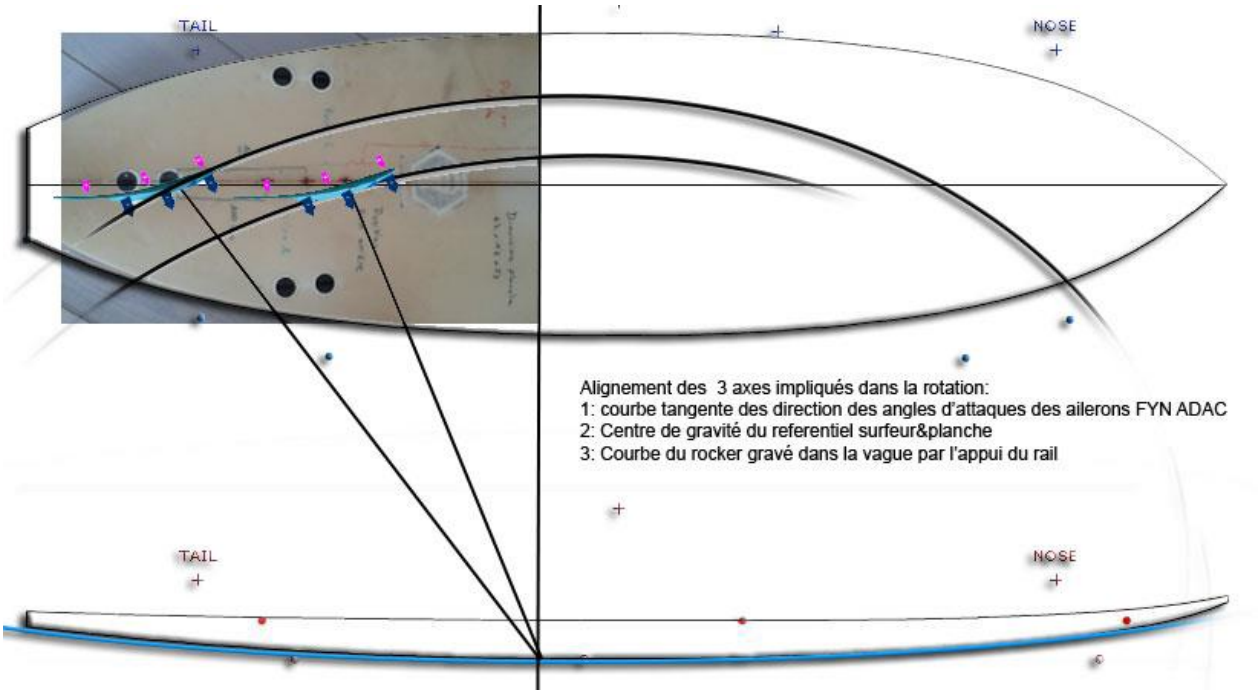
This therefore requires some trials involving:

- Observation of the rocker curve,
- Natural surfer position offering the best glide (usually on the flat board to generate a minimum drag, this depends on the volumes of the board, the outline and rocker, and the curve of the wave!)
- The overall position of the fins. (Forward to gain maneuverability, the drive back to win, apart to maximize the acceleration pulse effect of horizontal pump, tighten to increase the attack wipe effect increasing grip)

To fully exploit the potential of the ADAC system in an innovative shape, it is essential to realize that the automatic adjustment of the direction of the leading edge of the system ADAC, **generate a tangent curve path in the direction of the leading edge**, l the overall support pivot point, is no longer at the center of average cumulative drifts (as a static and rigid traditional set), but deported to a theoretical center of curved path that adapts to the movement applied.

Here is a small diagram to support the optimization of longitudinal positioning of fins line FYN:



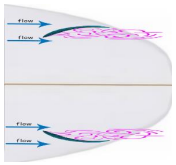


<u>Note the compatibility of the FYN configuration line</u>:

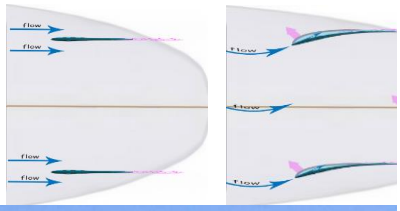
The online configuration is effective only with the ADAC system adaptation of angle of attack and dynamic camber. Fixed and static fins classic lines form a rigid straight rail that destroys maneuverability because they cannot change their angle of attack to match the curve.

The line configuration is for narrow boards and fluid surf style roll angles without bringing out the central part of the board of the water: A large board and / or radical turns at high speed with low immersion of board can cause a central fin "ventilation" (absorb air from the surface), and this is the stall assured. In this case, it is advisable to use a configuration with ailerons closer to the rails, such as the Twin center configuration, or some more conventional ones.

- **Configuration « Center Twin» :**



We have seen that the central line configuration can generate ventilation when the wing approaches the surface in certain turns on wide and fast boards. The twin is the solution brought by Simmons to the problem of ventilation. The angle of toe, introduced from the drive by effect of incidence, but it makes squint and work in opposition the lateral angles.



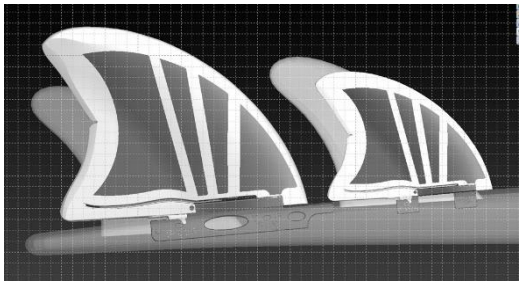
A "Center Twin" solution can be applied for wide boards equipped with ADAC system that will adjust the angles dynamically simultaneously on both drifts, the drive effect of the toe angle will be multiplied by the fact that the two fins work together , And a position close to the center improves the rail support lever detailed above.

FYN board thus leaving traditional locations on your Shapes not create any obligation to use the system ADAC. The choice of Genome is the result of free will, motivated by the understanding of the proposed hydrodynamic intake. The relationship between the initiator shaper and surfer initiated to ADAC system will be all the strengthened in confidence.

Go further with FYN?

No toe angle, no cant angle, such a development simplification can be disconcerting, but it releases a unique creative field.

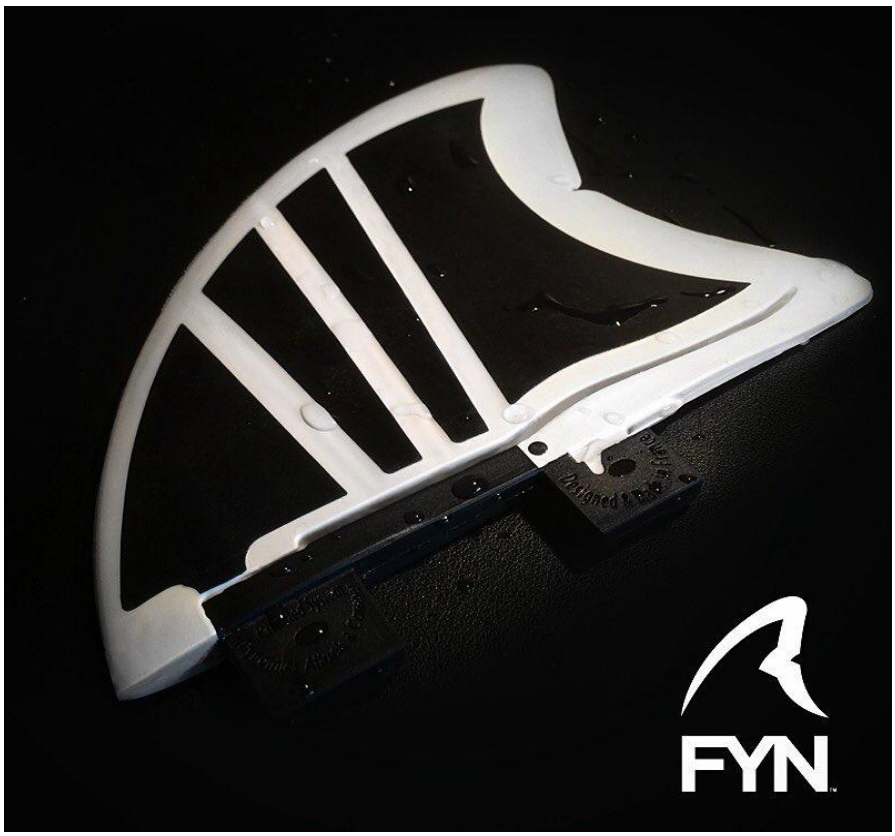
Remember that even the best of static bilateral settings, if harms itself during antagonists phases that must succeed in the path of surfer. The ADAC system abolished this limit by dynamically adapting angles and cambers according surf phases.

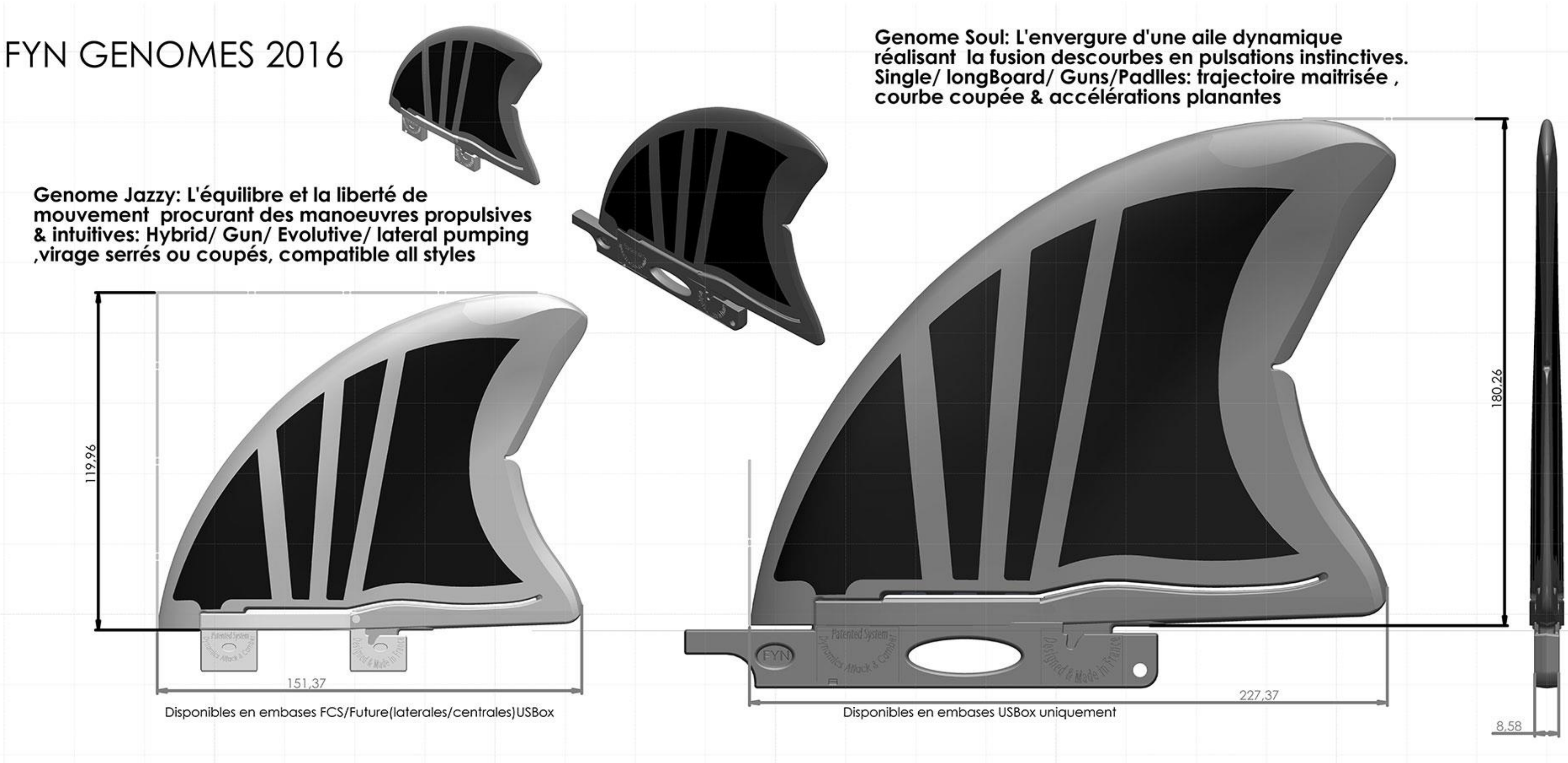


The "FYN line" or “Center Twin” configuration is a specific proposal, achievable through ADAC concept. This is a further opening of creation. This unique feature of producing dynamic effect of the flaps, is thus added to the use FYN in traditional configurations.

The shaper is the best teacher ever, to initiate the surfer, technical finesses surfing, and offer him new feelings through his art. We are available to shapers, sensitive to the hydrodynamic system ADAC, to assist in their implementation of the Genome FYN among the tools of creation.

L’équipe FYN

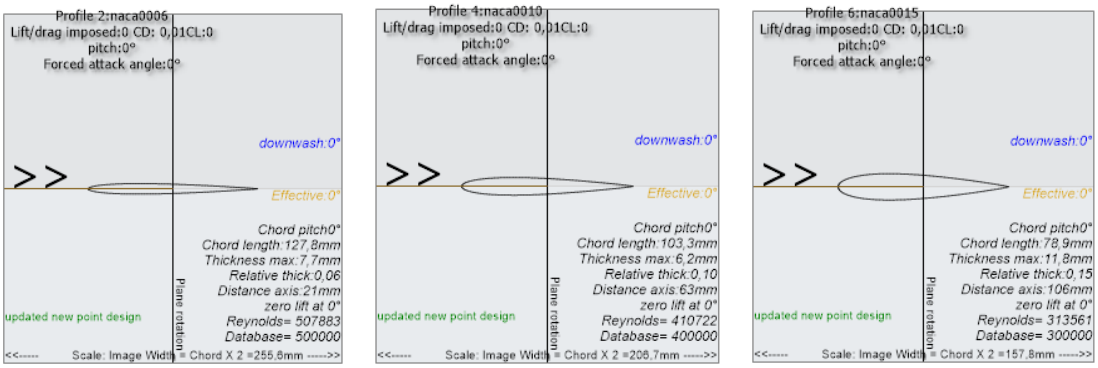



FYN GENOMES 2016
Genome Jazzy: L'équilibre et la liberté de mouvement procurant des manoeuvres propulsives & intuitives: Hybrid/ Gun/ Evolutive/ lateral pumping ,virage serrés ou coupés, compatible all styles
119,96
151,37
Disponibles en embases FCS/Future(laterales/centrales)USBox
Genome Soul: L'envergure d'une aile dynamique réalisant la fusion descourbes en pulsations instinctives. Single/ longBoard/ Guns/Padlles: trajectoire maitrisée , courbe coupée & accélérations planantes
180,26
227,37
Disponibles en embases USBox uniquement
8,58
Patented System
FYN

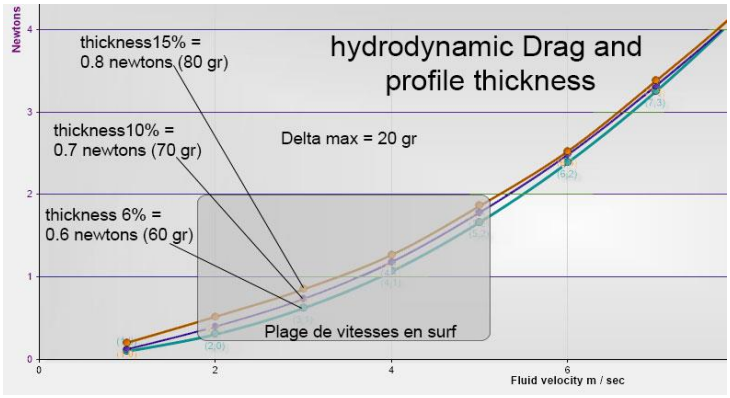
Annexes & hydrodynamic:

Appendix 1: Thickness for optimal hydrodynamic fin to the surfing speed ranges:

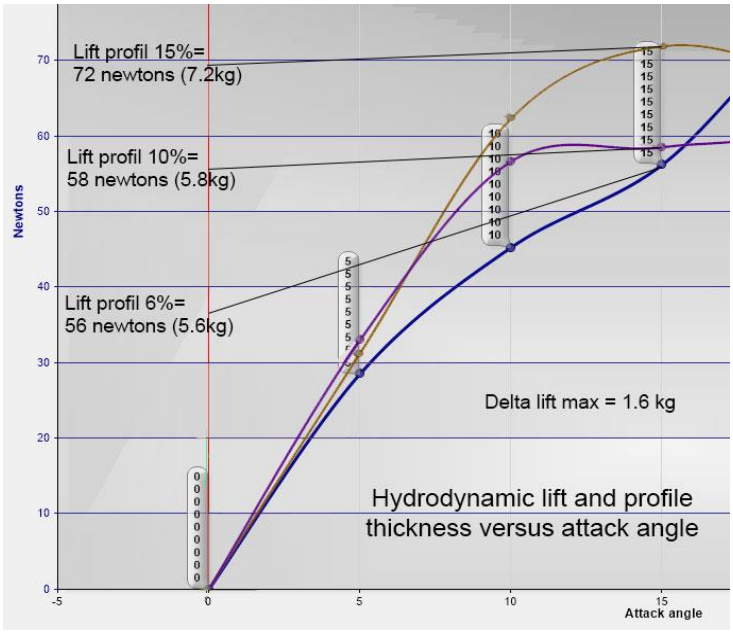
Comparative relative thickness profiles 6%, 10% and 15% of the chord:



- <u>Impact on the thickness of the trail of 0-6 m / s (21.6 km / h) at zero angle of incidence</u>: 20 grams of a drag difference between the thick profile and finest, the drag of the fin is born-negligible in the surfing speed range. For comparison, the only friction drag (without the form of drag) of the board without fins is around 15 newtons (1.5 kg) at a speed of 3 m / sec, 18 times the drag of a wing.

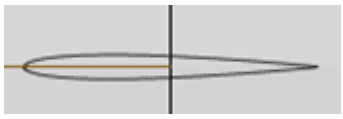


- <u>Impact of the thickness profiles on lift</u>, at low angles of impact. (Basic comparison for symmetric profiles arched and not static, in real life the ADAC system adapts the dynamic camber with the angle of incidence to further increase the lift) : At low angles of incidence a thickness of 15% provides a gain of 16 Newtons (1.6 kg) of lift (+ grip and propulsion). Fyn has chosen a fin thickness into account these phenomena, which combined with the appropriate camber allow an op-timale hydrodynamics.



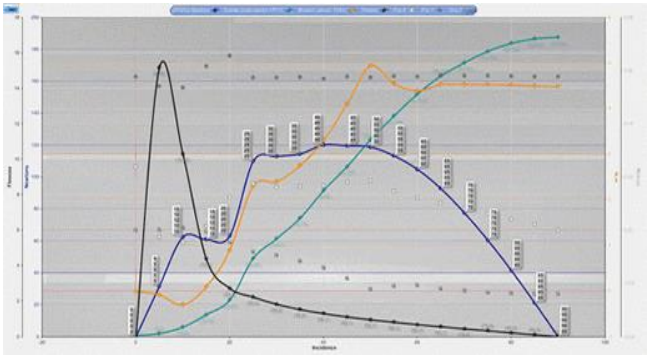
***data Sources**: Heliciel software.(http://www.mecaflux.com/suite/en/heliciel.php)*

Appendix 2: Contribution of camber adaptive:



- Profiles of surf fins, symmetrical:

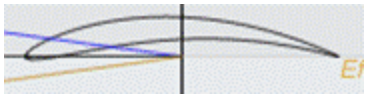
There are effective profiles at low angles of incidence, but who drop abruptly to larger angles and this produces for instance a loss of curve support (stall or spin out) due to the increase in incidence caused by the curved path. We will take for example here (Figure 2.1) a symmetrical profile NACA 0008: (Fig 2.1: Profiles surf symmetrical fins)



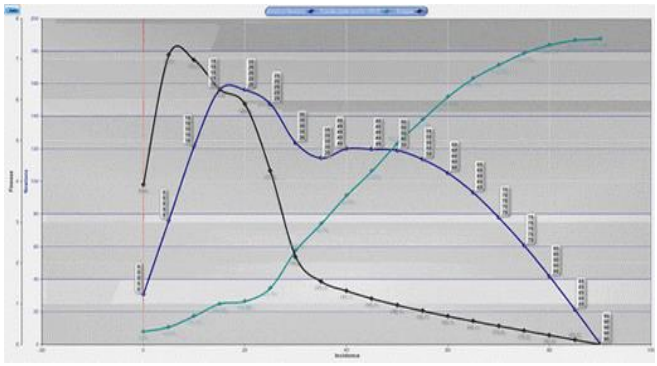
Here (fig 2.2) drag and lift curve (lift / drag) as a function of incidence variation at a given speed for a fin with this profile: (Fig 2.2: surf fins performance symmetrical)

- profiles cambered surf fins:

There are effective profiles to large angles of incidence, but generate a significant drag even when they have zero impact, this is harmful to the acceleration phases. We will take for example here (Figure 2.3) a curved profile NACA 9505 (Fig 2.3: Profiles of cambered surf fins)

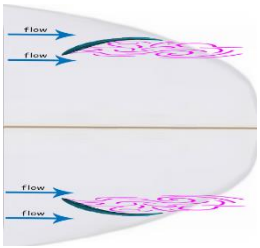


Which here (Figure 2.4) drag lift curve and sharpness depending on the variation of incidence at a given speed for a fin with this profile (Fig 2.4: Performance of cambered surf fins)



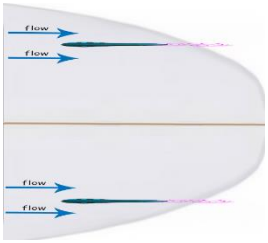
Appendix 3: Influence on drag:

The comparison of the profiles of the curves (Fig 2.1 and 2.3) shows a force (green curves) very low (0.7 Newtons) at zero incidence for symmetric profile (Figure 2.2). While a curved profile (fig2.4 curve) generates 8 newtons, of resistance to advance.



In a straight path, so there is a clear interest in using a symmetrical profile.

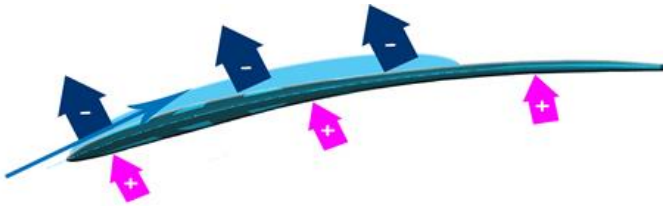
For an element of judgment, take the 2 opposite wings of a twin, with an angle of 4 degrees of incidence set by the shaper: 9 + 9 = 18 newtons of resistance, almost 2 kilos to push the end of the leg :



. ADAC SYSTEM aligns zero incidence ailerons and removes the camber when the path is parallel to the axis of the board (it also keeps the parallelism fins irrespective of the angle), so a delta of 18 -1, 4 = 16.6 newtons deleted drag:

Appendix 4: Influence on lift:

A curved profile generates a significant lift force even at low angles (Fig 2.4). The slightest slip or lateral component of movement transforms the profile ADAC SYSTEM in curved profile that generates more lift, so more camber, so more lift ...



The effect of this feedback loop generates a grip recovery almost immediate path, which makes it highly responsive system and reduces the time spent adjusting direction.

In our example a symmetrical fin (curve Fig 2.2) should be placed at 40 degrees incidence to generate lift 120 newtons while the fin variable camber ADAC SYSTEM already offers 120 newtons at 10 degrees (curve Fig 2.4) and up to 160 newton 15 degrees or unintentional sliding amplitude of the back of the board 4 times smaller for ADAC SYSTEM.

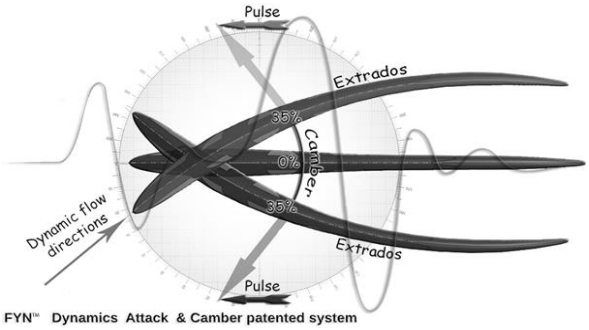
The change in camber SYSTEM ADAC therefore combines the performance of a symmetrical profile, which are optimum at the straight paths or very low incidence, with the performance of various profiles,

whose camber evolves to generate maximum bearing capacities from 5 degrees relative incidence up to 25 degrees without abrupt stall.

Appendix 5: Influence on the effectiveness range:

Beyond about 30 degrees of incidence, regardless of the shape of the profile, a phenomenon of hydrodynamic stall degrades more or less suddenly lift of a conventional fin (see Fig curves 2.2 and 2.4).

The adaptability of the angle of incidence of the ADAC system, allows to maintain optimum incidence angle by pivoting of the profile, according to the fluid path, thereby maintaining, effective angles of incidence, pushing back the stall effect, even in the tightest curves.



FYN™ Dynamics Attack & Camber patented system

The variation in incidence and camber is programmed "mechanically" by a controlled elastic deformation in a structure forming an articulated kinematic loop: Kinematics of ADAC SYSTEM causes the tilting of the direction of the lift of the fin towards the front, generating a propulsive component producing acceleration. This lift projection generated by ADAC SYSTEM provides two major advantages:

- Creating a natural ability to speed production at alternate lateral movements, particularly instinctive (pumping), comparable to a dolphin or fishtail motion.
- Production of acceleration when cornering, providing a dynamic path, opening up prospects of figures unfeasible without this boost..

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