Hello Bob

I looked at some early work the cockpit group at SVERA did about 10 years ago. We then agreed that it is important to have a design that can take chock loads from impacts and we did this comparsion between different materials

Material	Thornel® Carbon Fiber P-75S 2K	Thornel® Carbon Fiber T-50 6K	Thornel® Carbon Fiber T-650/42 6K	Hexcel® Carbon Fiber IM6	DuPont Kevlar® 49 Fiber, diam. 11.9 µm twisted yarn	Dyneema® SK60 High Strength Polyethylene Fiber	E-Glass	S-Glass	S2-Glass	Makrolon® 3103, Polycarbonate, General Purpose, UV Stabilized	
Breaking strength *Rm*	1900	2900	4820	5450	3620	3500	3418	4585	4890	72	MPa
Youngs modulus *E*	520	390	290	276	123	110	72,5	86,2	86,9	2,4	GPa
Max Strain((	0,37%	0,74%	1,66%	1,97%	2,94%	3,18%	4,71%	5,32%	5,63%	125,00%	
Energy / volyme	3,47	10,78	40,06	53,81	53,27	55,68	80,57	121,94	137,58	78,75	J/mm^3
Energy absorption relative glass	4,3%	13,4%	49,7%	66,8%	66,1%	69,1%	100,0%	151,3%	170,8%		
			Information from MatWeb								

-> Glass fibre is a way to get good impact strength

Of cause we need to learn from cockpits that has failed at accidents but we do also need to look at designs that has worked good at full speed accidents, like the roll Svenne Bengtsson did landing up side down at speed aboat 80 knots. In that boat you can see a substructure/roll bars that are strong enough to carry the full impact load.

It seems to me that substructure and window strength are critical parts to carry the impact load and also to check for risk for buckling of windows from hydrostatic loads. The presures that the windows have to take might be as high as 300 kPa.

Speed	85	knots
Density	1025	kg/m^3
Angle Window	35	degrees
hydralic pressure	322	kPa

It has been discussins about if the polycarbonate windows shall be formed cold or hot. It is not yet clear which way is the best.
Many of the boats today both cockpit and non cockpit has ballast today. I think we shall be restrictive on increasing the weight since it will end up in increase of ballast weight that might make the boat weaker.

best regards / Mikael Lundblad