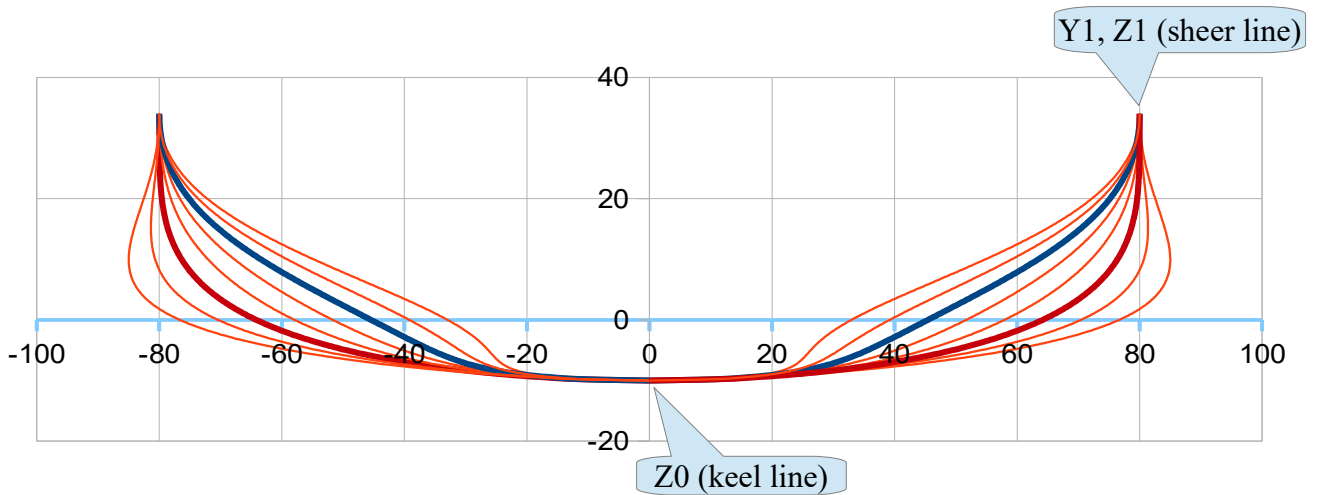


Bi-convex sections with a soft transition

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With section type « E » (Elliptical generalised type $X^p / a + Y^q / b = 1$) + a complementary function to flatten, dig or even expand the shape at mid height between the keel line and the sheer line. In the example here below, one starts from a classic shape (section in brown) and we progressively flatten up to a zero curvature on one point (section in blue) and then with a negative curvature zone. And the function also works reversely, then creating an expand which could be also an interesting option when searching for a very stable hull.



The formulation :

$Y = f [Z, 3 \text{ geometrical : } Z0 \text{ (keel line), } Y1, Z1 \text{ (sheer line) ; 4 adimensional parameters : PE1, PE2 (powers of the Elliptical part), KY (concavity amplitude), KZ (concavity position / z)].$

Above example is done with PE1 = 2, PE2=4, KZ = 0,4 and KY varying from 1,2 (expand), 1,1, 1,0 (brown section), 0,9, 0,8, 0,7 (blue section), 0,6 and 0,5.

$$Y = [Y1 * (1 - ((Z1 - Z) / (Z1 - Z0))^{PE1})^{1/PE2}] * [KY + (1 - KY) * \cos(((Z - Z0) / (Z1 - Z0))^{KZ} * \pi)]^2$$

Elliptical formulation
Shape function

The blue section alone :

