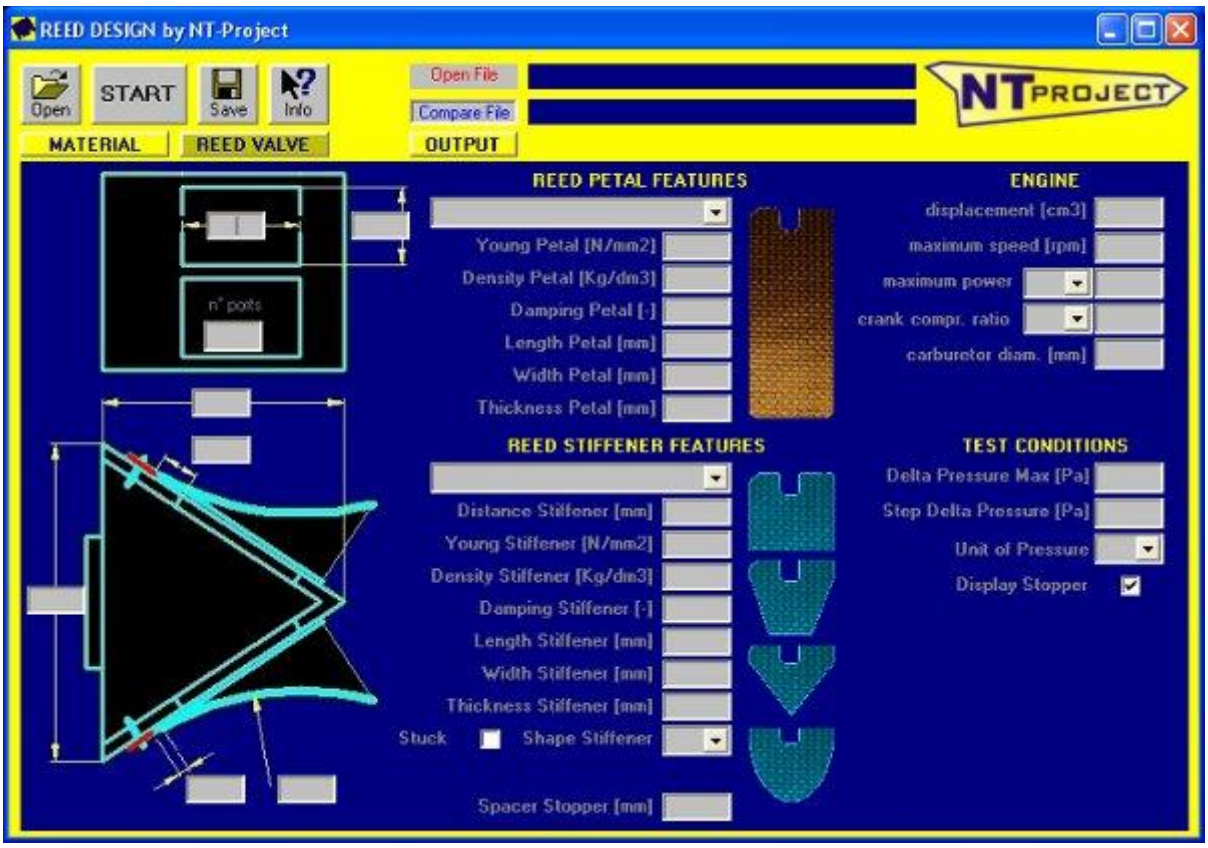
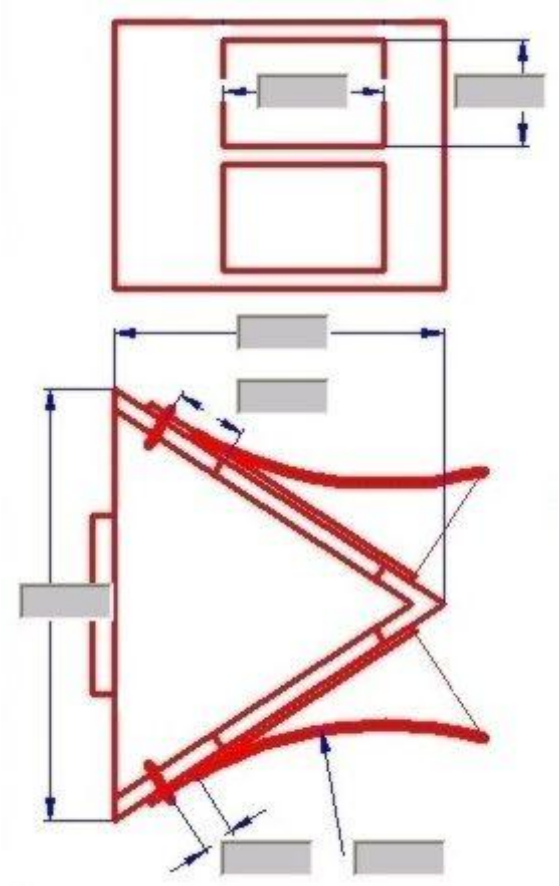
REED DESIGN - *presentation*



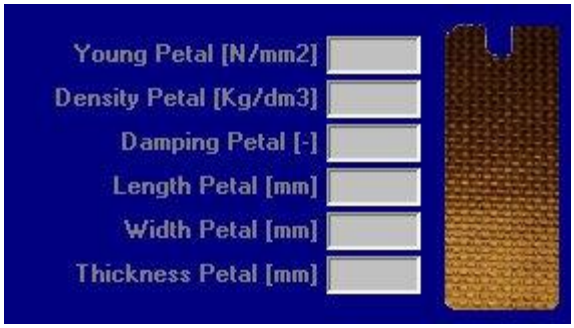
The software REED DESIGN at opening is in this way

REED DESIGN - *data entry*



The software REED DESIGN for first requires the data entry of the reed valve for which you want to identify the most suitable reed petals. These are the dimensions that characterize the shape and those of the ports where the flow passes.

In addition to these are entered the data of the reed petals for which you want to evaluate the behavior.



To analyze the displacement of the petal and the associated transition areas are sufficient the size and Young's modulus, while for the dynamic analysis you will also include the density and the damping coefficient, if you know it.

The software contains a database that already included the mechanical properties of sheets of carbon reed petals most sold (POLINI, MALOSSI, PINASCO, etc.), and also those used in the racing engine (VORTEX, TM, PAVESI, MAXTER, AKTIVE, ROTAX, etc.).

REED DESIGN - *stiffener data*

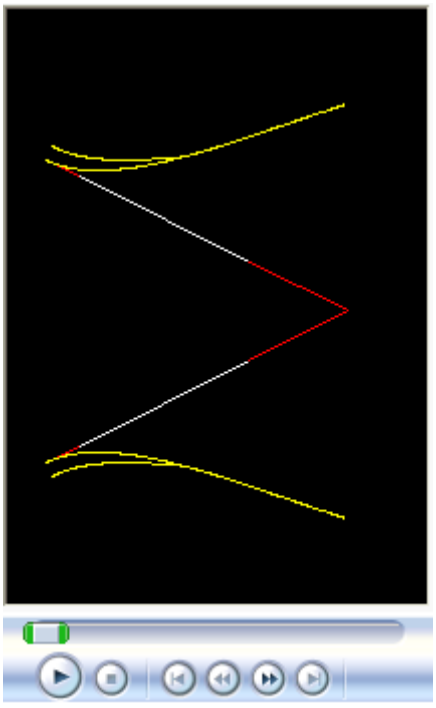
In addition to the study of kits with single reed petals, the software REED DESIGN also allows you to design and develop kits consist of petal and stiffener. In fact the possibility of adding a stiffener to the main petal allows you to change its behavior and to obtain different degrees of stiffness depending on the shape and size of stiffener. This is the key when you have an only material and thickness available and then if you need a stiffness different from that offered by single petal without to find the right stiffener would be impossible to use the sheet of material.

For this reason the software REED DESIGN has treated in detail the characteristics of stiffener, allowing you to evaluate the behavior of four different forms

The software REED DESIGN allows to evaluate the behavior also in the case if there is a spacer between the main petal and the stiffener so you can obtain a variable stiffness to vary the pressure conditions.

Finally you have the chance to see the behavior in case you want to stuck two sheets with different characteristics.

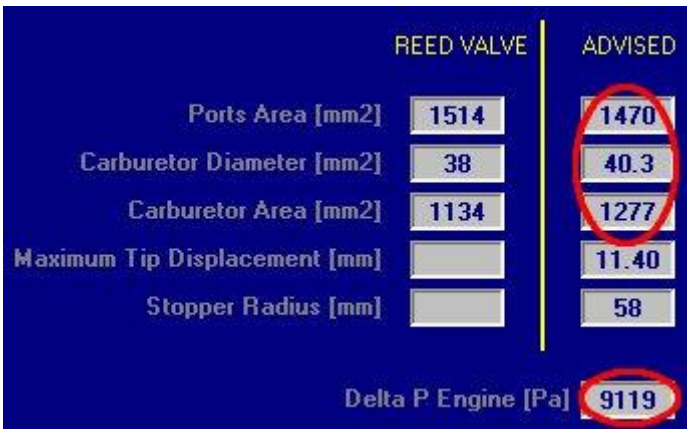
REED DESIGN - *petals displacement simulation*



The first result shown by the software REED DESIGN is the behavior of the reed petals choices under varying pressure conditions. The software can handle both the pressure range over which simulate the behavior of both the steps of analysis and the frequency of display..

REED DESIGN - *carburetor and engine data*

Inserting some data of the engine on which will be applied the reed valve, the software REED DESIGN performs a calculation that allows you to get a sense indicative of the size they should have the ports of the reed valve and the carburetor, and also determines the conditions of difference pressure which will work on average the reed valve during the operation.

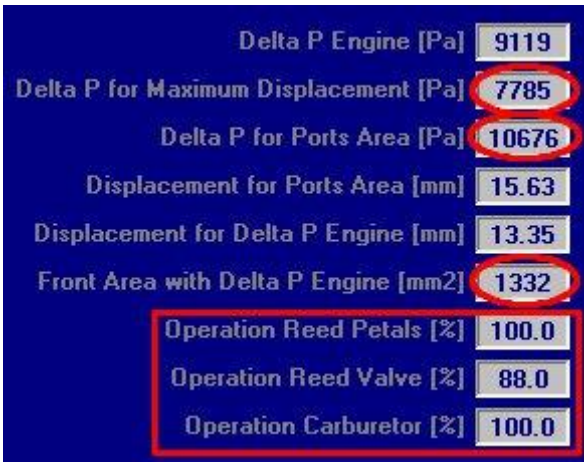


In this example you can see that after entering the engine data, the software REED DESIGN calculates the ports area that should have the reed valve, and the diameter of the carburetor to use; these values are compared with those of the reed valve and the carburetor inserted. Also is calculated the maximum displacement that the petals should have in relation to their geometry and the radius of a possible stopper to be applied to the reed valve.

Still with the engine data is calculated the difference of pressure that will be in operation at the turn of the reed valve and this value is very useful for evaluating the behavior of the reed petals to apply to the reed valve.

REED DESIGN - *petals operating simulation*

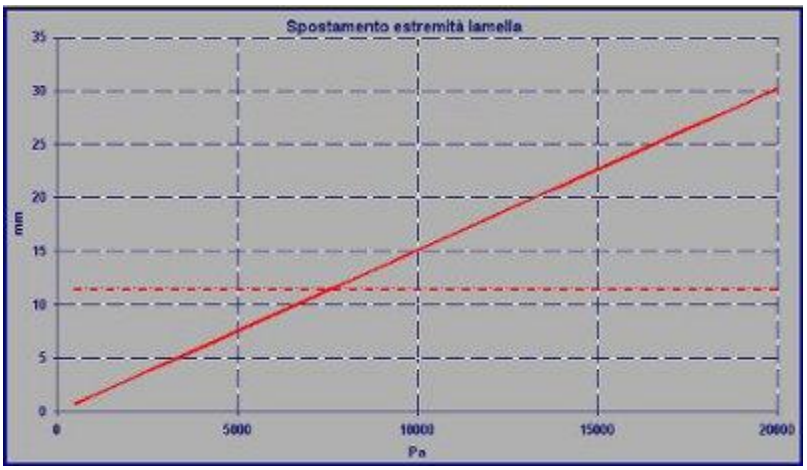
The software REED DESIGN calculates the behavior of the reed petals as a function of pressure difference and with this you can assess whether the petals choices are appropriate to the engine and to the reed valve on which they are applied.



From the results, you can see the difference in pressure required to reaches the maximum displacement recommended of the petals and also in which conditions the petals discover fully the frontal area of the ports of the reed valve. Thanks these values and with the pressure conditions that the engine determines, is possible to see immediately if the petals are adequate or not. In the case shown, for example you can see that the displacement recommended is reached during operation, while the ports are not fully discovered why there should be a pressure higher than that offered by the engine.

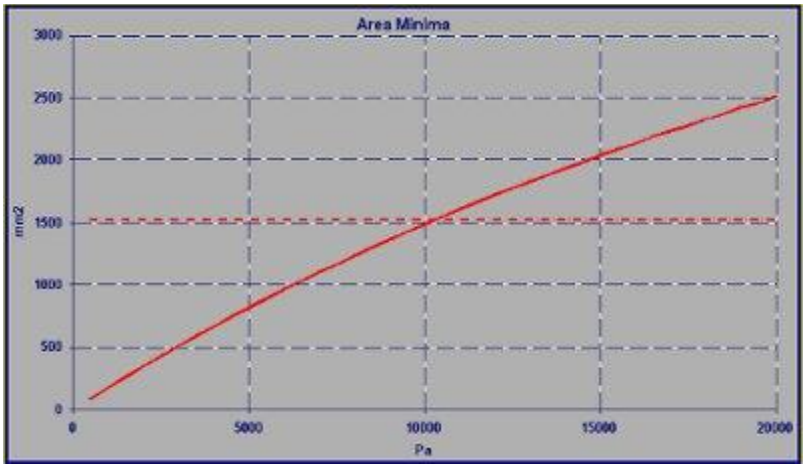
The software REED DESIGN calculates moreover the passage area through the reed valve during operating conditions and this is very useful to see whether or not to penalize the operation of the carburetor

REED DESIGN - *petals operating simulation*



PETAL DISPLACEMENT

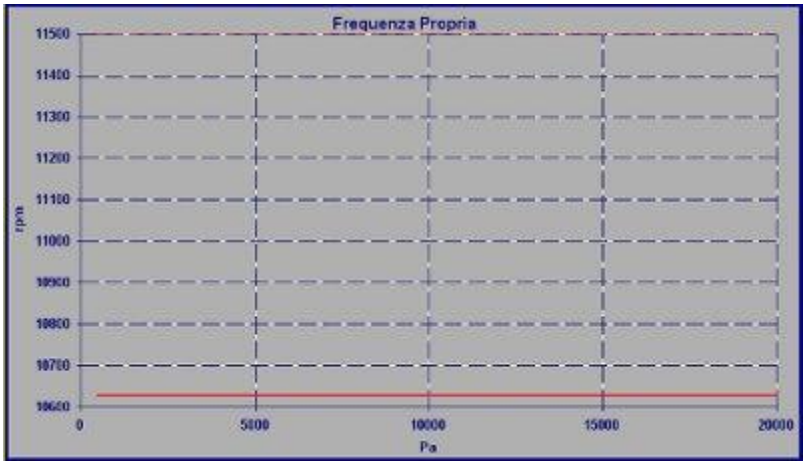
By varying the pressure difference is shown the tip displacement of the petal and this is compared with the value of maximum displacement recommended or imposed by the stopper (dashed line). This is very useful to see under what conditions of pressure the petal reaches the desired displacement and if these are consistent with those created by the engine during operation.



MINIMUM AREA MINIMA FLOW PASSAGE

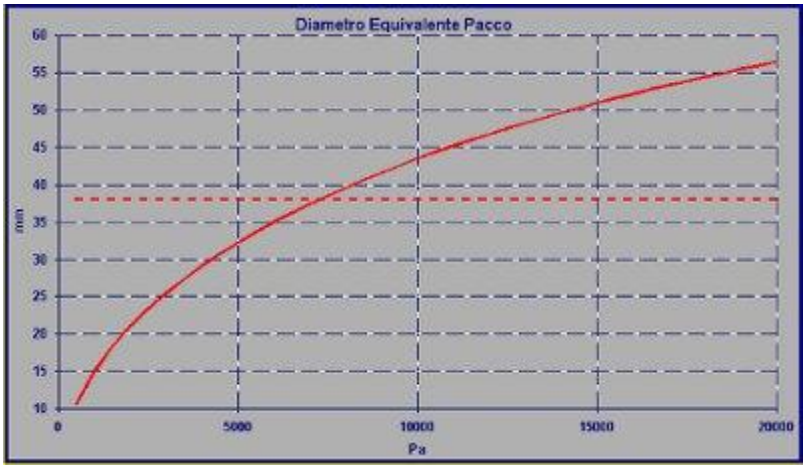
By varying the pressure difference is shown the passage area that there is through the petals and then determines the mass flow that will have through the reed valve. This area is compared with the frontal area of the ports of the reed valve (dashed line), so you can see under what conditions the petals discover all the ports and then when the reed valve is fully exploited.

REED DESIGN - *petal operating simulation*



RESONANCE FREQUENCY

By varying the pressure difference is shown the frequency at which the petals will be in resonance, based on their characteristics. The frequency is calculated in "rpm" to have an immediate comparison with the maximum engine speed (line dashed line) on which the reed valve is applied, this is very useful to see if the petals will be in resonance during operation and so if you may incur broken or have a greatly reduced life of the petals.

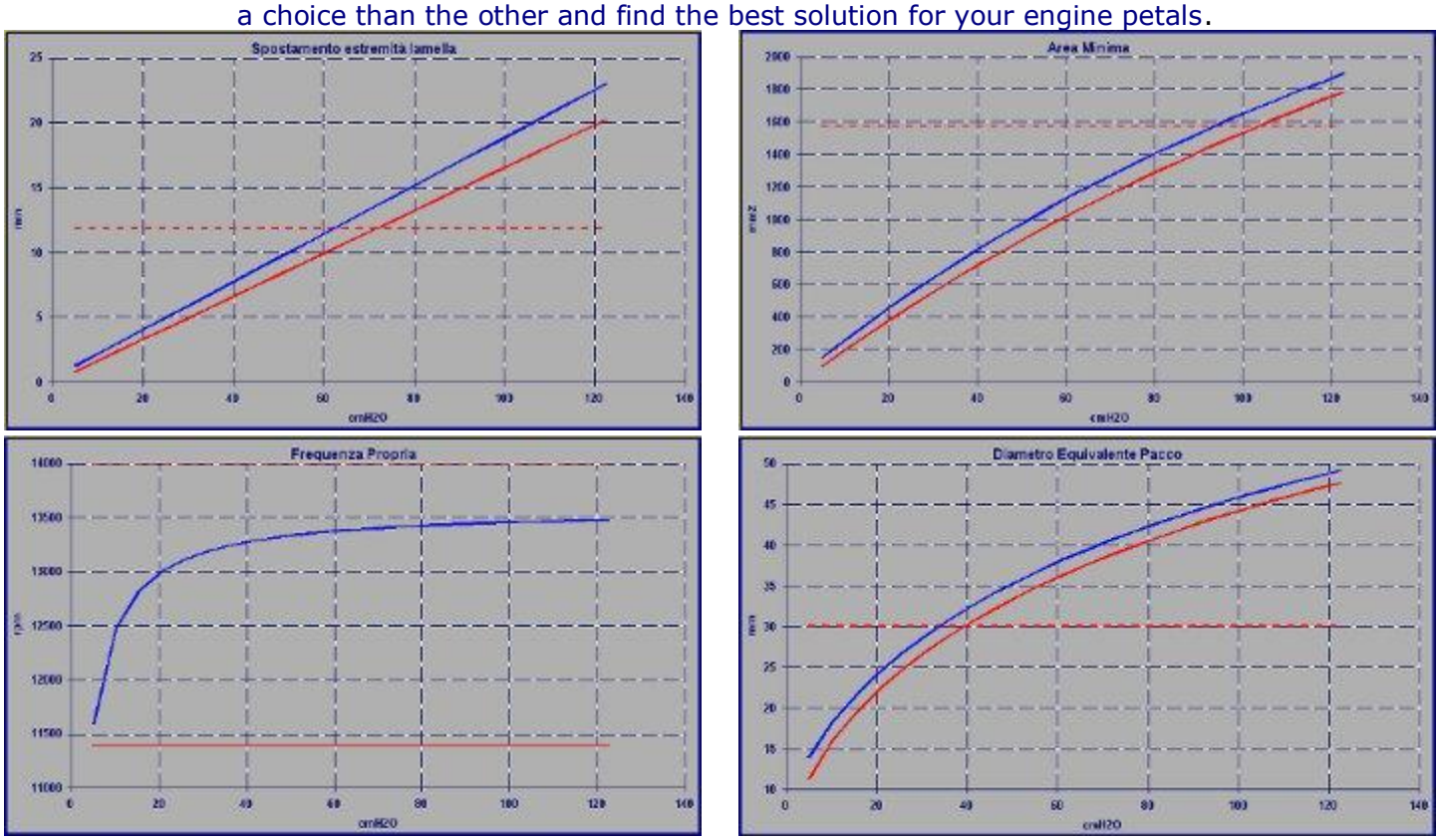


DIAMETER EQUIVALENT REED VALVE

By varying the pressure difference is shown the equivalent diameter which corresponds to the passage area through the petals in different pressure conditions. This diameter can then be easily compared with that of the carburetor used (dashed line) and then see if the carburetor has a diameter suitable for reed valve and petals used.

REED DESIGN - *comparison results*

The software REED DESIGN allows you to compare different solutions so you can see the concrete effects of a choice than the other and find the best solution for your engine petals.



In the example are shown comparison between solution with a single petal and others with stiffener and spacer interposed for elasticity variable.

REED DESIGN - *example dyno test*

In this example you can see the increase obtained to dyno test on an engine TM KZ10 with a kit of reed petals studied by the software REED DESIGN. We thank our customers for the courtesy of the image provided.

REED DESIGN

Thanks to the software REED DESIGN could then:

Assess if the reed valve and the carburetor are adequateto the engine

Check if the reed petals that you are using, are adapted to the conditions of operation, both as regards the aspect of performance that can offer (passage area) and for the reliability (frequency of resonance)

Design stiffener that allows you to exploit the avalaible material creating the right stiffness for the use and the conditions of operation that you need

Optimize the choice of petal and stiffener to get the best passage area under varying conditions of pressure and controlling the conditions of resonance and the dynamic behavior in the engine operation

Create kits petal and stiffener at variable stiffness identifying the optimum distance between the two elements to optimize the passage area and the resonance conditions in the different operating conditions

Find the best solution for your engine and your goals when you have petals of different materials and thicknesses, and you can then explore different combinations.

These are just some examples of the utility of the **software REED DESIGN** which can be summarized by saying that thanks to this software the **choice and development of petal kits pr petals and stiffener kits** will no longer be done by trial and error, thus wasting time and resources, but **will have a vital and effective technical support to move in the optimal direction quickly!**