Tutorial ecomic optimization

CaravelCut
Explorer l'usinage

Economic Optimization

Evaluate your production from the economic point of view (service without additional tests). We determine the cutting parameters to reduce your production costs.

Production Optimization

Evaluate your production (service without additional testing). We determine the cutting parameters for a better productivity

D.O.E for improving machining

We guide you step by step to carry out any design of experiment to improve any manufacturing process (grinding, cutting tool design ... etc.).

Statistical Analysis

If you hesitate between different cutting conditions, we do a statistical analysis to determine the best.

Reduction of torque

We look for the machining conditions aiming to reduce the torsion of your pieces.

Improvement of the roughness

We are look for the cutting conditions aiming to minimize the roughness of your pieces.

Tool life

We look for the machining conditions aiming to prolonging the life of your tools.

Accuracy and vibrations

We support you step by step to determine the origin of inaccuracies or signs of vibration on your machined parts.

Reduction of burr.

We look for the machining conditions aiming to reduce the burrs of your pieces.

Kriging Interpolation

If you have a list of tests already done, you can enter the results and use our interpolation to predict values and find the conditions offering the better results.

sélectionnez le service

select the service

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Economic optimization of machining

Factors

By opening a project (button: Open / New Project) you get an evaluation of your machining from the economic point of view.

The Software of the site will suggest you strategies for the optimization suitable in your case.

If your machining appear to be too cautious, you need to act on factors that can make it faster even if the tool wear will also be faster.

On the contrary, if your machining is likely too expensive in terms of cost of the tool, you must act on the factors which probably will prolong the tool life.

Thanks to the software of our website, you can achieve the economic optimization by setting several factors simultaneously. Up to 4 factors.

For example, the factors that you can modify to improve your machining from the economic point of view may be:

- cutting speed (Vc)
- feed (f) or feed per tooth (fz)

Possibly others as: - step for peck drilling . . . etc.

Description

User manual

Choice of factors

See an example

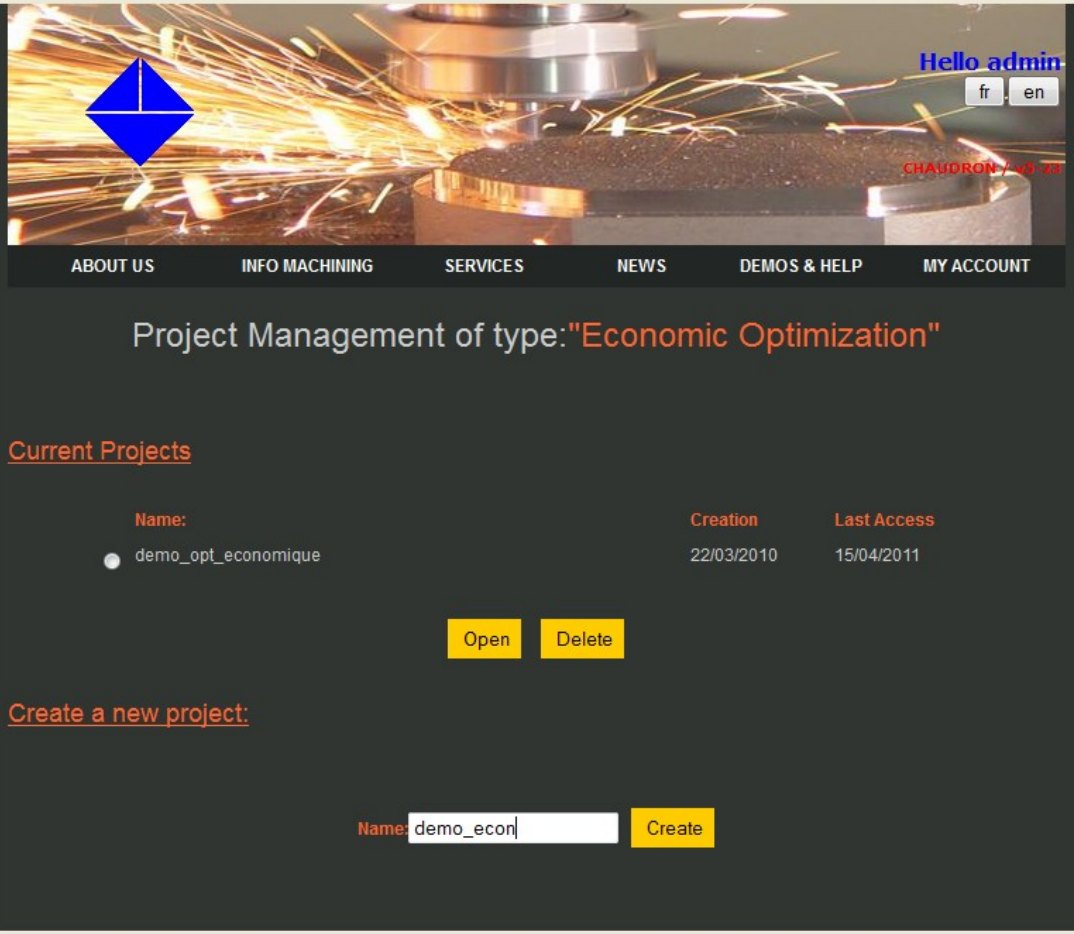
Open / New Project

127.0.0.1/index.php?page=services_project_manager

informations sur les facteurs qui influencent le problème

information on the factors that influence the problem

définir le nom du projet



set the project name

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Economic Optimization - Project : "demo_economic"

Step 1 - Enter the economic information:

The economic optimization aims to indentify the cutting parameters that provide the best solution from the economic point of view. Therefore, economic data of the machining (hourly cost of the machine, purchase price of the tools... etc..) are essential.

These data, as all data in this website, are managed strictly confidential: without human intervention

Enter the currency you wont use for costing €

hourly machine cost (including salaries, maintenance, and overhead):	0	
Price of the tool:	0	
Cost of sharpening:	0	
Number of resharpening the the tool:	0	sharpening
Time to change the tool:	0	seconds

Next

définir la monaie

define the currency

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Enter the currency you wont use for costing: Euro

hourly machine cost (including salaries, maintenance, and overhead):	0	Euro
Price of the tool:	0	Euro
Cost of sharpening:	0	Euro
Number of resharpening the the tool:	0	sharpening
Time to change the tool:	0	seconds

Next

... et les autres informations économiques

... and the other economic information

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Enter the currency you wont use for costing: Euro

hourly machine cost (including salaries, maintenance, and overhead):	120	Euro
Price of the tool:	0	Euro
Cost of sharpening:	0	Euro
Number of resharpening the the tool:	0	sharpening
Time to change the tool:	0	seconds

Next

coût horaire de la machine ...

hourly machine cost ...

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Enter the currency you wont use for costing: Euro

hourly machine cost (including salaries, maintenance, and overhead):	120	Euro
Price of the tool:	25	Euro
Cost of sharpening:	0	Euro
Number of resharpening the the tool:	0	sharpening
Time to change the tool:	0	seconds

Next

coût de l'outil ...

tool price ...

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Enter the currency you wont use for costing: Euro

hourly machine cost (including salaries, maintenance, and overhead):	120	Euro
Price of the tool:	25	Euro
Cost of sharpening:	0	Euro
Number of resharpening the the tool:	0	sharpening
Time to change the tool:	0	seconds

Next

affutage (si existe) ...

sharpening (il any) ...

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Enter the currency you wont use for costing: Euro

hourly machine cost (including salaries, maintenance, and overhead):	120	Euro
Price of the tool:	25	Euro
Cost of sharpening:	0	Euro
Number of resharpening the the tool:	0	sharpening
Time to change the tool:	6	seconds

Next

temps de changement de l'outil

tool change time

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Economic Optimization - Project : "demo_economic"

Step 2 - Enter information about the operation to optimize:

A -machining operation- is an operation that uses a single tool, and uses some cutting parameters that will be the subject of optimization.

Examples: 1) Drill a hole 2) Machining a pocket 3) Removal of a certain volume of material ...

Note: to select the operation you want to optimize, use the following criteria:
1 - machining operations that take a long time
2 - machining operations that use quickly the tools

If the tool used in the operation you want to optimize is also used for other operations (with other cutting parameters or other conditions and types of cut), you need to instal an additional tool of the same type into your tool changer, to fully optimize the operation in question, You need to use both tools separately for each operation one for the operation to be optimized and the other for all other operations. This way you can measure the wear produced by the operation to be optimized. (Otherwise you will have to estimate it and the calculation of the cost of the operation will necessarily be less accurate).

Duration of the operation	14	minutes
The total number of operations that the tool comes to realize, even after resharpening	4	N° op.

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durée de l'opération ...

... nombre d'opérations

operation time ...

... number of operations

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Economic Optimization - Project : "demo_economic"

Step 3: Information on your existing machining conditions:

The following table gives the total cost of the machining operation under the current conditions. The total cost is the sum of the cost due to the machine the machine and the cost due to the tool life.

Machine cost	28	Euro
Tool cost	6.3	Euro
Total cost	34.3	Euro

It would appear that the cutting parameters that you currently use are too prudent.

You can print a report with these evaluations on your production — Create a report

You can search for more efficient cutting parameters from the economic point of view. (This possibility requires testing). In this case press the button: - Next- — Back | Next

vous obtenez une évaluation de votre usinage

you get an assessment of your machining

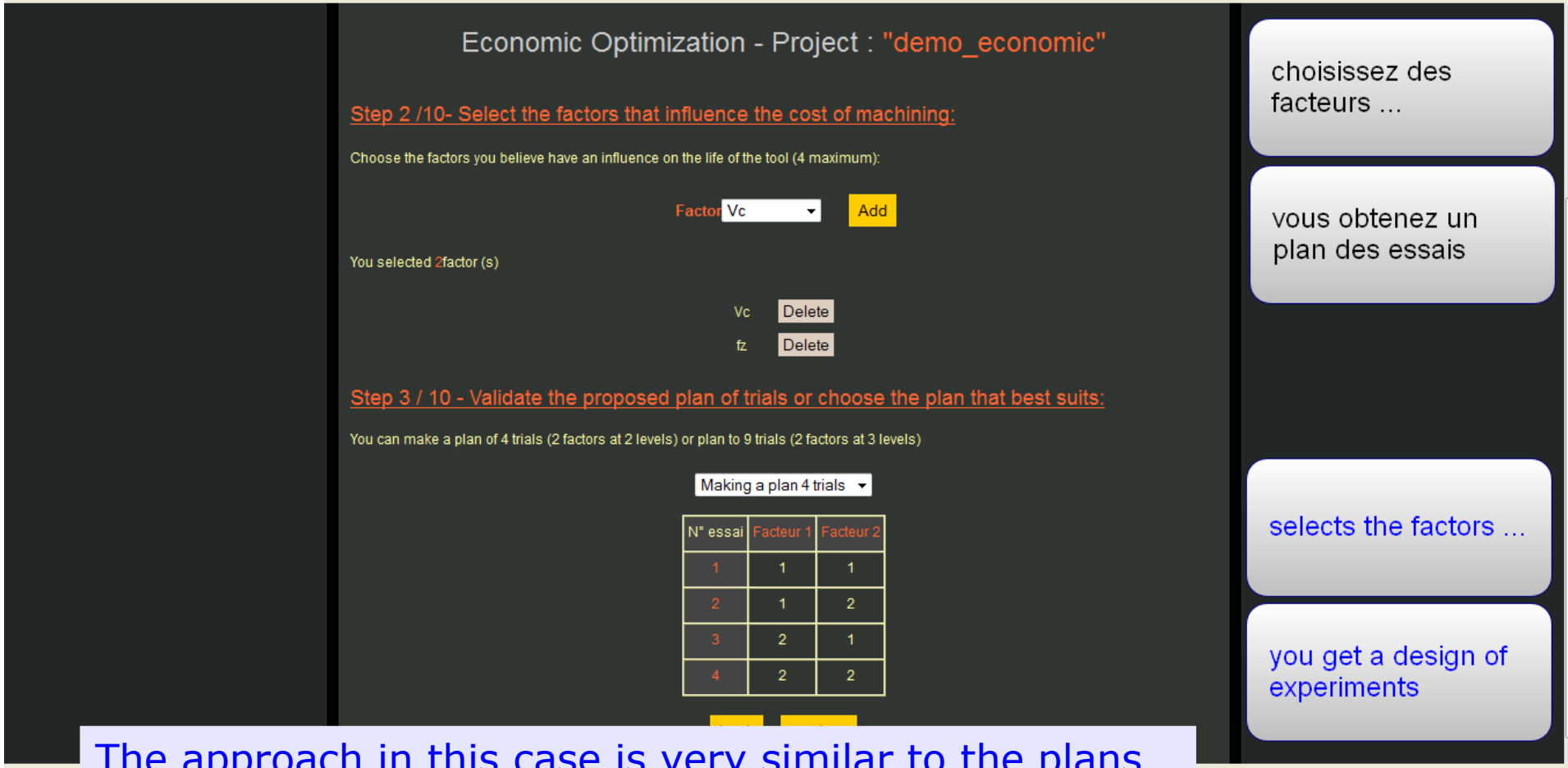
Vous obtenez une évaluation économique, sans aucun essai, avec une description de votre usinage. ...

… vous pouvez continuer et obtenir une optimisation.

You get an economic evaluation, without trial, with a description of your machine.

... from here, you can go ahead and obtain an optimization.

La démarche en ce cas est très similaire à celle des plans des expériences. (Voir le didacticiel pour « amélioration de l'usinage ») .



choisissez des facteurs ...

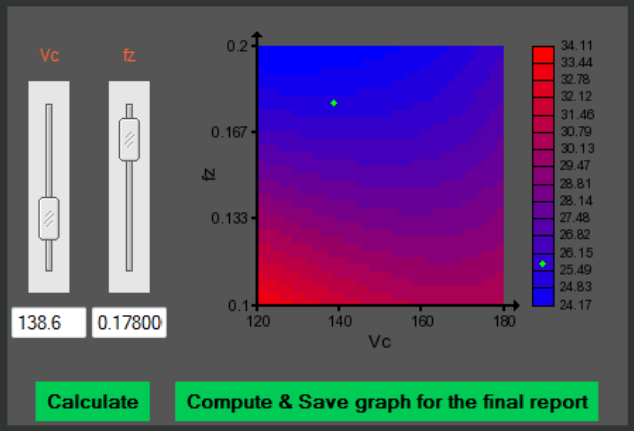
vous obtenez un plan des essais

selects the factors ...

you get a design of experiments

The approach in this case is very similar to the plans of experiences. (See the tutorial for "improving machining").

Based on the experimental plan, you can predict the result by setting the factors as per your wishes:



Calculate | Compute & Save graph for the final report

The table below provides a forecast of the tool life and production costs in following conditions:
Vc: 138.6 fz: 0.17800000000000002

Duration of operation	7.75	min.
Life Tool	2.452	operations
Machinery ost	15.499	Euro/ Operation
Tool cost	10.278	Euro/ Operation
Total cost	**25.777**	**Euro/ Operation**

de 34.3 a 25.7
Euro / opération

from 34.3 to 25.7
Euro / operation

Bon travail

Good work

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Exploring machining

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