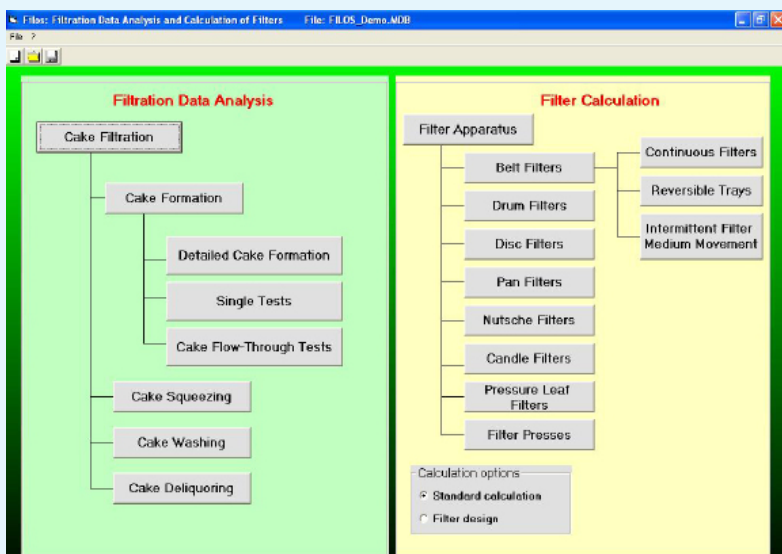




SOLID LIQUID SEPARATION EXPERT

SOFTWARE • COURSES • CONSULTANCY



Software

for Filters, Filtering Centrifuges and Hydrocyclones
Design, Performance Simulation and Optimization
Analysis of Test Data and Suspension Characterization

Courses

One, two or three - days course at your place. Vivid presentations. Learn in short time how to effectively face Solid-Liquid Separation tasks

Consultancy

Professional and objective Support for any Solid-Liquid Separation Problem.
Maximal Benefit at Low Costs

Courses in Solid-Liquid Separation

One, two or three - days course at your place

Our slogan is: **“Understand Solid-Liquid Separation and learn how to effectively face Solid-Liquid Separation problems”**. The long teaching experience, the practice oriented approach with examples and the vivid presentations of Prof. Nicolaou gives the guarantee for a highly effective course.

Overview of the Course Content (valid for the 3-days course)

Introduction to Solid-Liquid Separation - Suspension Characterization - Suspension Pre-Treatment - Sedimentation Theory - Sedimentation Machines and Apparatuses - Introduction to Filtration - Filters and Filtering Centrifuges - Filter Media - Theory of Filtration for Filters and Filtering Centrifuges - A worked out example for the Calculation of the Cake Formation Step in Filters and in Centrifuges - Cake Washing in Filters and Centrifuges, Theory and practical aspects - Cake Deliquoring in Filters and Centrifuges, Theory and practical aspects - An overview of diverse Filter Apparatuses - An overview of diverse Filtering Centrifuges - Calculation of a Nutsche Filter and a Filtering Centrifuge - Selection Criteria for Solid-Liquid Separation Equipment.

Consultancy in Solid-Liquid Separation Projects

We offer you our support for any Solid-Liquid Separation project. Prof. Dr. Nicolaou, with his more than 30-years focused research and practice experience on this field, is a guarantee for an objective, cost saving effective and quick solution of your Solid-Liquid Separation problem.

We do our Best so that you have maximal benefit at low costs!

Software for Solid-Liquid Separation

Safe Time and Money, Solid Liquid Separation Made Easy and Interesting, Professional Support

Powerful, practice oriented, user friendly and reliable Solid-Liquid Separation Software based on the up to date Filtration and Separation theory and on minimal experimental effort

- **FILOS**
- **CENTRISTAR**
- **FILTRATION CALCULATOR**
- **FILTRAPLUS**
- **CYCLONPLUS**



Scale-up, Design, Performance Simulation & Optimization of diverse Solid-Liquid Separation Machines and Apparatuses:

- Belt Filters, Drum Filters, Pan and Disc Filters, Continuous Pressure Filters, Nutsche Filters, Candle and Pressure Leaf Filters, Filter Presses and Filter Press Automats
- Filtering Centrifuges (Horizontal and Vertical Peeler Centrifuges, Vertical Basket Centrifuges, Inverting Filter Centrifuges etc.)
- Hydrocyclones

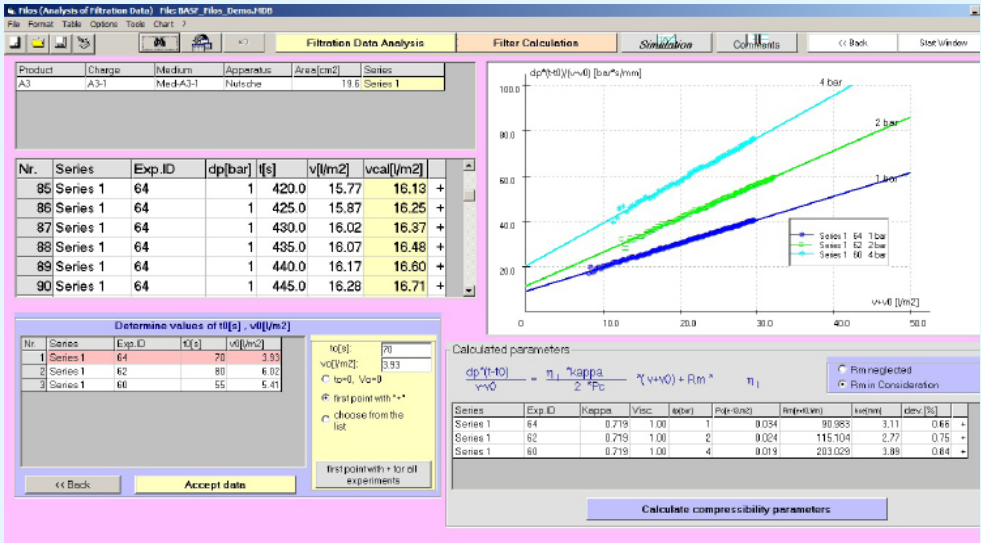
Test Data Analysis by using practice oriented and physically based mathematical models

- Determination of the necessary material parameters for the simulation of Solid-Liquid Separation Machines and Apparatuses
- Characterization of the filtration and separation behavior of your suspension, comparison of different suspensions
- Analyzing and judging the quality of your experiments
- Saving of all Simulations, Test data and Analysis Results in an intelligent Database as Tables and Graphs

FILOS

The Software for Filter Design, Performance Simulation, Optimization & Analysis of Filtration Test Data

Analysis of Cake Formation, Cake Washing, Cake Deliquoring and Cake Squeezing Data from Laboratory-Pilot-Industrial scale Tests

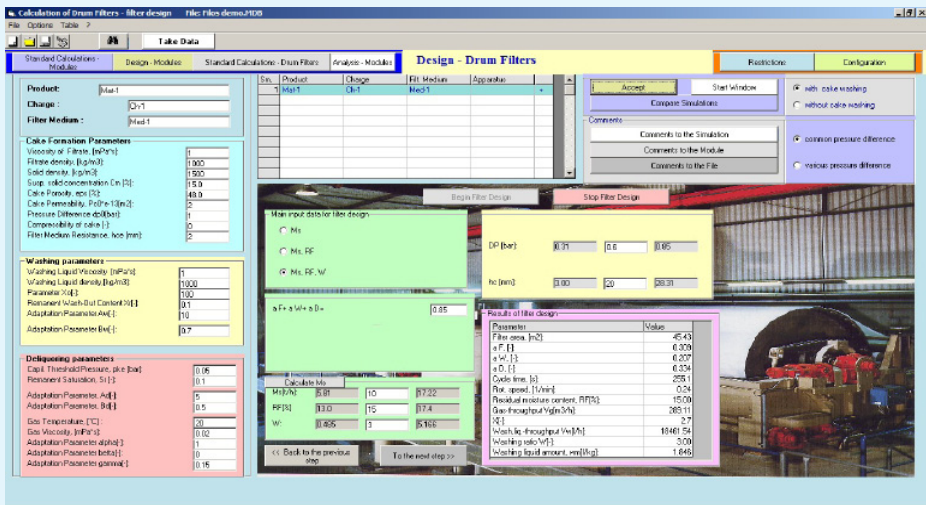


- Reliable and user friendly determination of the important material parameters: cake permeability/resistance, cake compressibility and filter medium resistance (needed for the calculation of all Filters in the Filter calculation modules) is the main job of the Data Analysis modules *Detailed Cake Formation, Single Tests and Cake Flow-Through Tests*.
- User friendly and reliable determination of all adaptation parameters necessary for the calculation of the cake moisture content, the gas flow rate (Cake Deliquoring module) the wash out content in the cake (Cake Washing module) and for Filter Press applications the moisture content and the cake permeability as a function of the squeezing pressure (Cake Squeezing module).
- Judgment of the quality of the filtration tests, comparison of the filterability of different suspensions, creation of a suspension typology, saving of all measured and analyzed data in an intelligent database.

FILOS

The Software for Filter Design, Performance Simulation, Optimization & Analysis of Filtration Test Data

Belt Filters, Drum Filters, Pan and Disc Filters, Nutsche Filters, Candle and Pressure Leaf Filters, Filter Presses and Filter Press Automats



Standard Calculation: Calculation of the filter performance for a given suspension and given filter and filter setting parameters.

Filter Design: Calculation of the needed filter area when the filter performance is given.

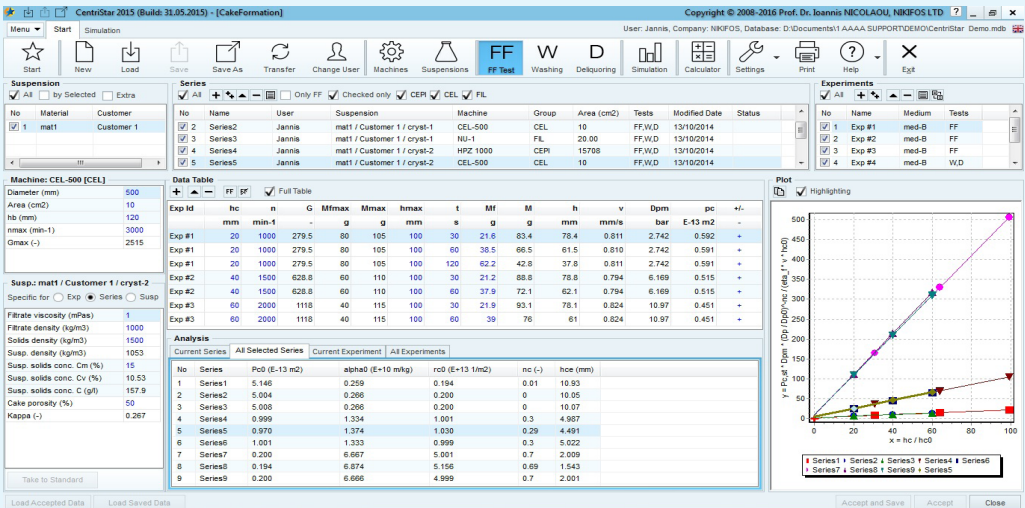
All important and widely used Filter Apparatuses are considered. In the same file many simulations can be saved enabling a comparison of the filter performance for different suspensions, filters and / or filter setting parameters. All necessary material parameters can be automatically transferred from the Filtration Data Analysis module.

CENTRISTAR

The Software for Batch Filtering Centrifuges

Centrifuge Design, Simulation and Optimization of Centrifuge Performance,
Analysis of Test Data, Database for all Simulations, Test and Analyzed Data,
Machines and Suspensions

Analysis of Test Data from Industrial/Pilot Centrifuges, Laboratory
Bucket Centrifuges and Filter Nutsches



The cake resistance / cake permeability, cake compressibility and filter medium resistance (including the resistance of the cake heel) as well as adaptation parameters for the cake washing and deliquoring step, all needed for the calculation of the centrifuge performance are determined by analysing of test data. Tests with different apparatuses can be analysed and plotted in the same diagram enabling a direct comparison as for example of the centrifuge and filter nutsche results.

The Software for Batch Filtering Centrifuges

Simulation of the Centrifuge Performance

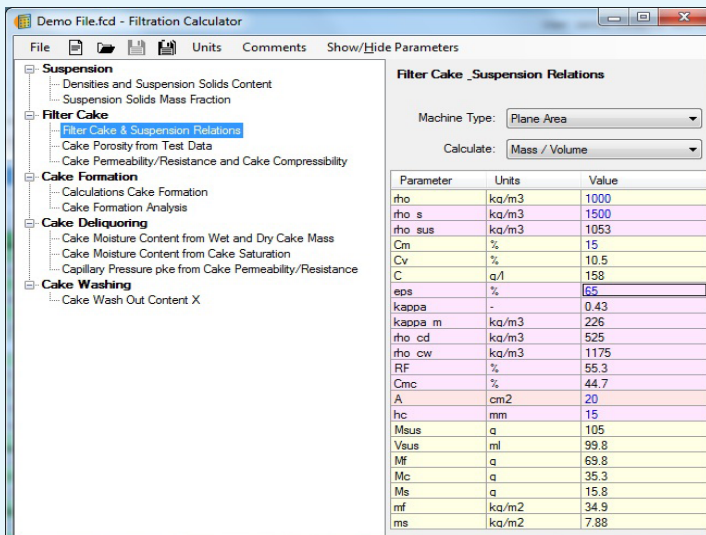
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FILTRATION CALCULATOR

Flexible & Easy Calculation of Filtration Parameters A *Must* for all Dealing with the Filtration of Suspensions

With its 11 modules the user can solve small tasks easily and with highest flexibility: Solids density from the densities of liquid and suspension and the suspension solids content. Cake porosity from tests with a nutsche or a candle filter or a centrifuge under consideration of non-volatile solutes in the cake liquid. The powerful module Cake Formation Analysis enables the determination of the cake permeability / cake resistance and the cake porosity from only one test!



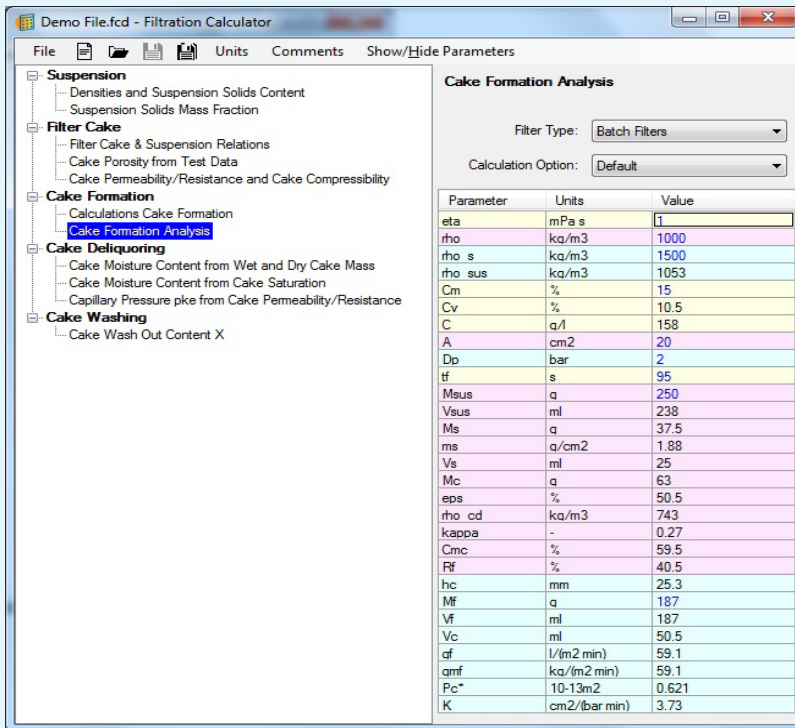
Further modules enable: The calculation of the cake formation step considering the cake compressibility and the filter medium resistance. Cake moisture content from wet and dry cake mass or from cake porosity and cake saturation. Capillary threshold pressure from the cake permeability / cake resistance. Cake wash out content from the wash out concentration in the wash filtrate of the resuspended cake etc.

Groups of parameters allow high flexibility regarding the input parameters. Distinction of input and calculated parameters by displaying them in different color.

FILTRATION CALCULATOR

Determine Filtration Parameters: Cake permeability / cake resistance and cake porosity from only one test with Batch or Continuous Filters with the highest flexibility!

Most important module of Calculator. It determines from one experiment both parameters: cake porosity and cake permeability/cake resistance with the highest flexibility regarding the input parameters.

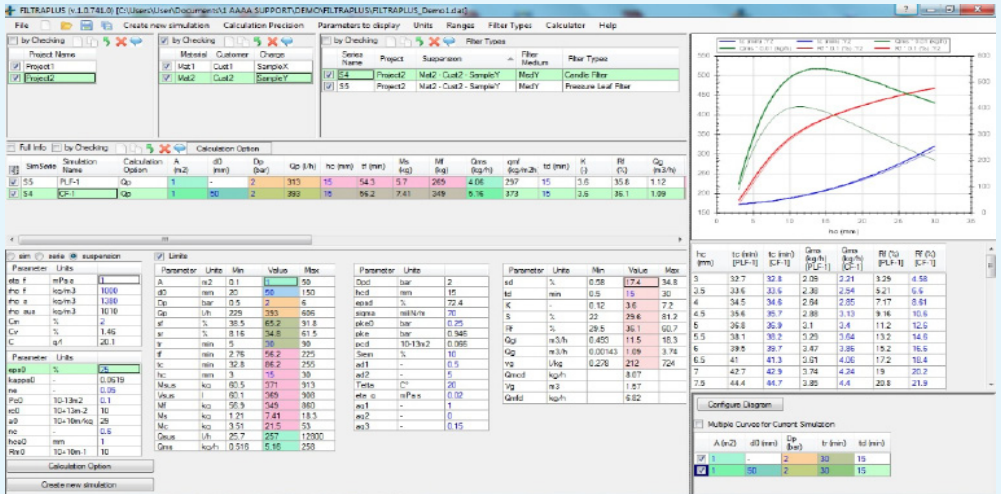


Enables the determination of cake porosity and cake permeability not only from Batch filter tests data but also from data of Continuous filters. This module can be also used to simulate the performance of Batch and Continuous filters if the porosity and permeability of the cake are entered instead of calculated.

FILTRAPLUS

Design, Performance Simulation and Optimization of diverse Filters Made Easy

Powerful • User Friendly • Practise Oriented
The ideal Complement to FILOS

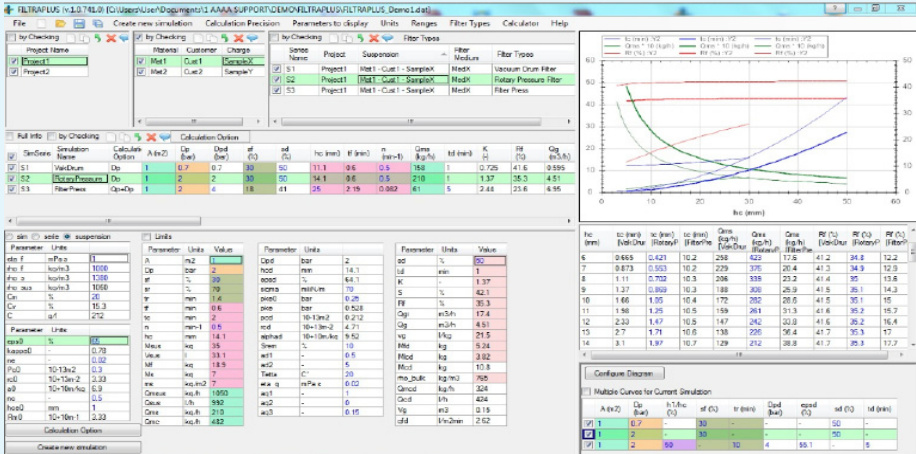


- All in one window: Filter simulations, diagrams and tables with automatic refreshing of the diagram and tables when changing any input parameter.
- Performance of different filters can be compared in the same diagram. For example we can directly compare a Candle Filter with a Pressure Leaf Filter or a Vacuum Drum Filter with a Rotary Pressure Filter and a Filter Press (see figures).
- Use of Up to date practice oriented theory for cake formation and cake deliquoring step with consideration of cake compressibility and filter medium resistance.
- Cake Formation with constant pressure difference, constant suspension flow rate (volumetric pump) and combination of constant flow rate and constant pressure difference (centrifugal pump) for both: plane and cylindrical filter area.
- For the first time calculation of the liquid evaporation during the cake deliquoring step.

FILTRAPLUS

Highest Flexibility in Filter Simulation

Direct Comparison of the Performance of different Filters in the same Diagram



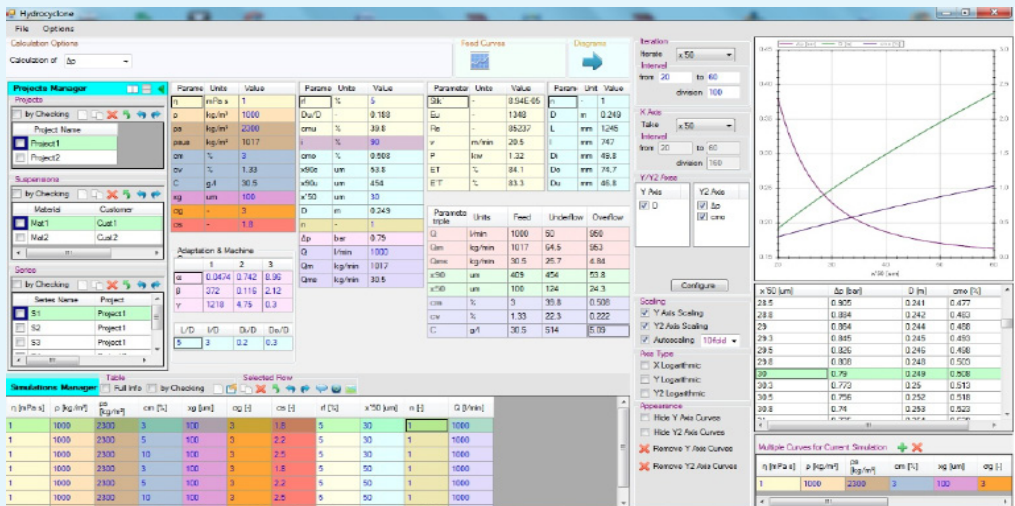
- Highest Flexibility in the input parameters due to the powerful concept of parameters grouping.
- Best overview with separate listing of Projects- Suspensions – Series – Simulations. This enables the saving of all simulations in one file without losing the overview and with easy and direct comparison of simulations from different projects, different suspensions and different Filters.
- Very powerful diagram concept. Any material, settings and result parameter can be selected as x-axis parameter. Two y-axes diagrams also in Logarithmic axes. Practically plotting of any diagram possible!
- Dynamic Limits concept. A powerful tool with calculation and display of the minimal-maximal values for all parameters enabling the input of only meaningful values.
- On-Line Help System with detailed explanations to all parameters and all program functions.

CYCLONPLUS

The Novel Software for Hydrocyclones - Design and Performance Calculation

Practice Oriented • User Friendly • Reliable

Physically based and reliable calculation of the Hydrocyclone performance for given geometry with consideration of parallel connection of Hydrocyclones or determination of the needed size and number of Hydrocyclones for a given performance. Highest flexibility for the input parameters by using the parameters grouping concept.



In case of the Hydrocyclone Design typical input parameters are the separation efficiency expressed as the cut size x50, the specific underflow rate r_f , the pressure drop Δp and the feed flow rate Q . Calculated parameters are the cyclon diameter D , the number of cyclones in parallel connection n and the underflow orifice diameter D_u . Alternatively many other combinations of input parameters can be used what makes the program very flexible and powerful.

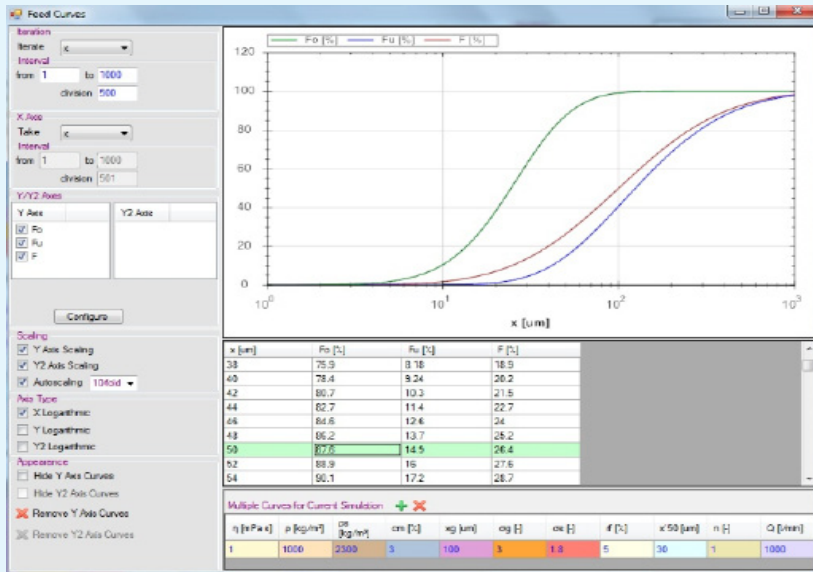
CYCLONPLUS

The Novel Software for Hydrocyclones - Design and Performance Calculation

Practice Oriented • User Friendly • Reliable

For the performance calculation the diameter D and number of cyclones n in parallel connection together with the feed flow rate Q are given and the separation efficiency (cut size x_{50}) as well as the pressure drop Δp are calculated.

Many other important parameters like the total efficiency E_t , the solids content and the particle size distribution of overflow and underflow are calculated and displayed. The influence of all parameters included the solids content in the feed can be studied. Best program concept allows among others user friendly comparisons with the display of the results in form of powerful diagrams ready to be used for your report.



All in one window: List of Projects, Suspensions, Simulations, tables and graphs with the possibility to display any required diagram. Analysis of experimental data and determination of necessary adapting parameters. Automatical creation of a Word document as report with the summary of the main results.

Prof. Dr. -Ing. Habil. Ioannis Nicolaou

More than 30 years focused Research and Industrial experience on Solid - Liquid Separation

NIKIFOS President since 2000

- Born in Cyprus, as Greek Cypriot
- Diploma in Chemical Engineering, University of Karlsruhe / Germany, 1984 (graduating with distinction – first class)
- PhD, University of Karlsruhe / Germany, Institute of Mechanical Process Engineering and Mechanics, 1991 (passed with distinction – first class)
- Emil Kirschbaum Award for an Outstanding Diploma (1985) and Heinz-Maier-Leibnitz Award of the German government for an outstanding research work on Filtration (1994)
- Professoral Thesis (Habilitation), University of Karlsruhe / Germany, 1996
- Research Fellow as Co-worker of Prof. Stahl, a worldwide leader in Applied Solid-Liquid Separation Research work, 1986-1996
- Head of the Solid-Liquid Separation and Crystallisation Group, Siemens (former Hoechst AG), 1997-2000
- Professor at the University of Karlsruhe / Germany since 1997 with own lectures and visiting Professor at the University of Florida, Engineering Research Center for Particle Science & Technology, Eminent Scholar, 2002
- President of the Company NIKIFOS since 2000, Consultant, Software Developer and Trainer



YOUR BENEFITS BY USING OUR SOFTWARE

- Practise oriented, reliable, user friendly, experiment & theory based design, performance calculation and optimization of all important Filter apparatuses, Filtering Centrifuges and Hydrocyclones.
- Minimal experimental effort (under some conditions even one experiment is enough) with maximum yield of information due to the powerful and user friendly test-data analysis modules for all steps (cake formation, washing, deliquoring) and due to the inter- and extrapolation reliability of the physically based mathematical models. Saving of time and money.
- The quality of the test data can be easily judged due to the theory based diagrams of the Data Analysis program modules.
- The performance of Solid-Liquid Separation equipment can be quickly and easily simulated and judged (also for settings which can not be experimentally tested due to experimental limitations). Determination of the optimization potential.
- Comparison of the performance of various Solid-Liquid Separation equipment enables for a given suspension the correct selection and optimization of the selected equipment.
- Creation of an “intelligent” database for all tested suspensions including all test analysis input and results data as well as all simulations.
- Project reports can be easily prepared.
- A valuable tool for training purposes.
- An ideal sales tool for impressing and convincing your customers.

Licensing Options

The programs are normally yearly licensed. Possible is also the licensing for more than one year. Besides the standard single user licensing option which is restricted for local use we offer also a company license with unlimited use for all company locations. For more information please contact us

Filtration & Separation of Suspensions

Professionality• Objectivity• Reliability• Maximal Benefit at Low Costs

- Do you need professional, practise oriented and very effective short courses in Solid – Liquid Separation at your place?



- Are you currently facing a problem in Solid – Liquid Separation and you need an immediate, professional, objective and inexpensive support?

- Are you dealing with the Filtration of Suspensions and you want to judge the performance of your filters and optimize them by determining the optimization potential with minimal experimental effort?

- Do you need novel, user friendly, reliable, powerful and practise oriented software for the design, calculation and optimisation of the performance of diverse cake forming Filter Apparatuses and for characterizing the filtrability of your suspensions by theory based analysis of the filtration tests?

- Do you need a very powerful and user friendly software for the performance calculation and optimization of Batch Filtering Centrifuges with theory based analysis of Centrifuge test data to determine the necessary parameters for reliable Centrifuge simulations?

- Are you confronted with projects involving scale-up and performance optimization of Hydrocyclones and you need a novel, user friendly and reliable software to help you solving your problems fast and inexpensive?

Contact us

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