

PSE for
SPEED

Company Profile

**Sustainable Product-Process
Engineering, Evaluation & Design**

Introducing

PSE for SPEED

A newly formed company that develops, implements and employs state of the art PSE methods and tools to solve a wide range of problems of industrial and research significance, reliably, efficiently and very rapidly!!!

The company is founded by Prof Rafiqul Gani together with Prof Mario Eden, Dr. Sawitree Kalakul, Dr. Amata Anantpinijwatna, Dr. Anjan K Tula and Dr. Surat Areerat.

The company has also access to an international team of experts who can be counted on for specific projects and/or problem solutions.

Our

Mission

Apply systematic computer aided methods and tools to solve a wide range of problems of industrial relevance and research significance, reliably, efficiently and very rapidly.

Our

Vision

- Find novel, innovative, & sustainable solutions for well-known as well as new chemical processes-products through the appropriate use of models, methods, tools and experience.
- To reach defined goals, corresponding targets that will lead to more sustainable alternatives, must be achieved.
- To look for “win-win” solution for all parties concerned. methods, tools and experience are available.

Our

Information

Established:

March 2017 with head quarter in Bangkok

Owners:

- Prof Rafiqul Gani
- Dr. Surat Areerat
- Dr. Sawitree Kalakul
- Dr. Amata Anantpinijwatna
- Dr. Anjan K Tula
- Prof Mario R Eden

Expertise:

more than 50 years of combined experience in development, implementation and application of state of the art systematic computer aided tools to solve problems

Our Products

PSE for SPEED provides a suite of systematic and computer-aided tools (PSE Tools) for solution of a wide range of product-process engineering problems

These PSE Tools are based on state of the art systems approach and are continuously updated and improved by incorporating latest data, new concepts, improved models, efficient algorithms, etc., to provide reliable, robust and rapid solutions to our customers.

The PSE Tools consist of tools for property estimation; process modelling; molecular and/or process design; process intensification; LCA analysis, sustainability analysis, economic analysis and many more



Product Simulator

ProCAPD - Computer-Aided Product Design (provides options for product simulation, modelling, synthesis, design, evaluation, substitution, etc.)

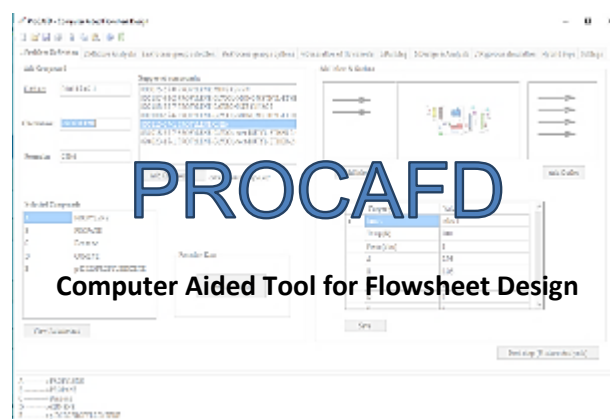
The first and only computer aided tool available for users in industry as well as academia

- Useful for chemical substitution problems
- Useful in retrofit design-analysis
- Most used tools are Property-Prediction (ProPred) and computer aided molecular design (ProCAMD) and SolventPro) - already used by many companies

Flowsheet Design

ProCAFD - Computer-Aided Flowsheet Design (provides options for flowsheet synthesis, process design, link to external simulators, process analysis, etc.)

ProCAFD is an innovative and new software that guides the user through its 12-step process design hierarchy. These steps start with problem definition and end with finding the targeted sustainable process design, and, include a synthesis step, a design step, several analyses steps (economics, sustainability and LCA). Also, a step for rigorous process simulation where links to commercial simulators are available.



Integrated Computer Aided System

ICAS combines computational tools for modeling (including property prediction), synthesis/design, control and analysis for chemical products and their processes in a single integrated and flexible system.



Properties Prediction

ProPred: The property prediction tool, which uses molecular structure as the input to estimate pure component properties and environmental related properties.

Molecular Design

ProCAMD: Tool based on computer aided molecular design method used to design molecules, such as solvents, with specific pure component and mixture properties.

Solvent screening & design

SolventPro: Special software based on ProPred, database, ProCAMD plus new solid solubility and solvent screening modules for pharmaceutical industry.

Azeotropes

AzeoPro: Computer aided tool based on a hybrid approach of database search and calculations that identify azeotrope information, based on which provide innovative and efficient separation process design

Modeling tool

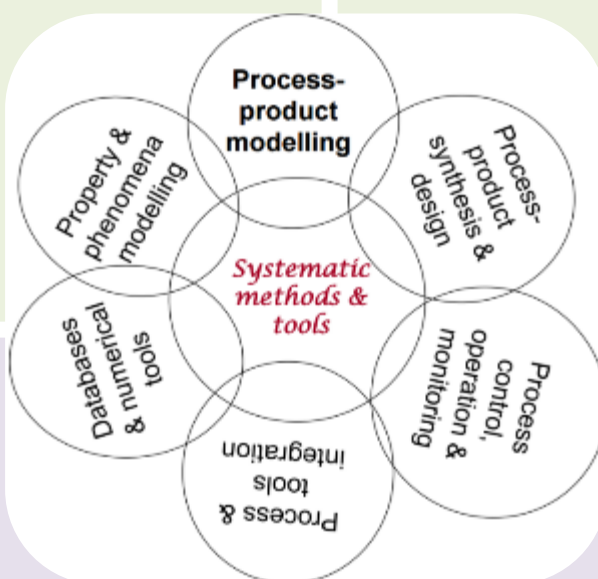
MoT: Modelling testbed suitable for model creation, analysis and solution, without the user having to write any programming codes

LCA software

LCSoft: Lifecycle Assessment tool, which employs an indicator based method to calculate a wide range to environmental impacts, foot-prints, factors, etc., for processes and products.

Sustainability analysis

SustainPro: Sustainability analysis of a process by identifying economic, operational, environmental, and safety related bottlenecks of a process.



Economic analysis

ECON: Economic and sensitivity analysis of process by cost calculations based on published cost models.

Our Services

Our experienced team is ready to provide a wide range of services as needed by our customers.

TECHNICAL CONSULTANT SERVICES

PSE for SPEED consulting provides expert advice in the application of advanced process modelling, property estimation, process-product synthesis & design, and process-tools integration. We help you clarify and achieve your goals for innovative technology, integrate sustainability, and more efficiency.

- Process design and development
- Innovative product design and analysis
- Chemical Substitution
- Properties estimation/ calculation of chemical (Pure/mixture)
- Database generation and management
- Feasibility and market analysis
- Process flowsheet synthesis – process flow diagrams (PFDs)
- Mass and Heat integration, Energy intensity and efficiency
- Intensify innovative alternative process
- Process optimization and control
- Cost estimation analysis
- Life cycle assessment, environmental impact assessment

PROBLEM SOLUTION SERVICES

PSE for SPEED experienced team are ready to provide the customized solution services to customer. Our team are willing to do project base case or collaboration support your working team.

WORKSHOP AND TRAINING SERVICES

We offer a variety of topics for informing about the current state of the art on PSE related topics, training on theory as well as practical hands-on intensive workshops or courses. Some selected topics are listed below.

- Thermodynamic property prediction (state of the art; modelling of properties; hands-on computer aided training)
- Model identification (kinetic model parameter estimation, thermodynamic property model parameter estimation)
- Chemicals based product design (single species, multi-species, hands-on computer-aided exercise with ProCAPD)
- Separation techniques (separation of azeotropes, process intensification, solvent selection, use of ICAS tools, Solventpro)
- Sustainable process design (highlights the use of the 12-steps design methodology)
- Superstructure based optimization (biorefinery, CO₂ conversion, process synthesis-design, wastewater treatment, etc.)

Our Collaborators

PSE for SPEED has available, an international team of experts with whom it plans to work jointly to advice, solve and train in a wide range of PSE related problems.

Currently, PSE for SPEED is able to proudly represent the following international experts:

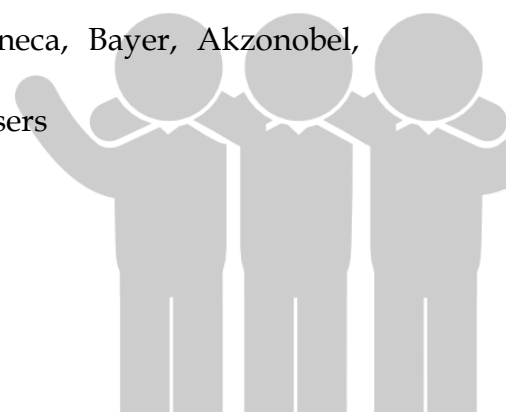


Our Expertise

Expertise: more than 50 years of combined experience in development, implementation and application of state of the art systematic computer aided tools to solve problems

Our personnel have worked with many well-known companies to solve a wide range of problems - a short list is given below:

- Chemical substitution & solvent screening: many industrial problems solved (see several joint publications with industry - GSK, AstraZeneca, SCG, Syngenta, AkzoNobel, Mitsubishi Chem Corp, Alfa Laval, BASF, Bayer, DSM, Total,)
- Property modelling (predictive methods) - Alfa Laval, Syngenta
Principal collaborators are from academia (USA, Brazil, Korea, Mexico, Malaysia, Thailand,)
- Process synthesis & design - Alfa Laval, Union Carbide (before 1997), Firminech, FMC; Mitsubishi Chem Corp, SCG,
- Chemical product synthesis & design - Syngenta, Astrazeneca, Bayer, Akzonobel, Unilever
- Integrated computer aided systems (ICAS) - Many industrial users



Executive *TEAM*

Rafiqul Gani President & CEO

Dr. Rafiqul Gani retired at the end of 2017 as professor of systems design at the Department of Chemical & Biochemical Engineering, The Technical University of Denmark and the former head and co-founder of the Computer Aided Process Engineering Center (CAPEC). He has published 466 peer-reviewed journal-proceedings articles plus book chapters and delivered over 300 lectures, seminars and plenary/keynote lectures at international conferences, institutions and companies all over the world.

He is the former Editor-in-Chief of Computers & Chemical Engineering journal. He was President of the European Federation of Chemical Engineering for 2 terms (2014-2016-2018). He is a Fellow of AIChE as well as IChemE.

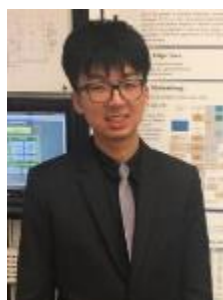


Surat Areerat Head of Administration

Asst. Prof. Surat Areerat is co-founder of PSE for SPEED and management director on administrative section for company. He is lecturer at Department of Chemical Engineering, King Mongkut's Institute of Technology Ladkrabang. His main research is Microcellular foam technology, Polymer processing, Rubber technology, Utilization of supercritical CO₂ for polymer processing.

Anjan K Tula Head of Process Engineering

Dr. Anjan K Tula is a Postdoctoral researcher at Department of Chemical Engineering, Auburn University products. His main area of expertise is in development of computer-aided methods for process synthesis and innovation. Prior to joining PSE for SPEED, he obtained a doctorate degree in the area of process synthesis-design and analysis. His work has been widely accepted and published in several international conferences.



Yodsathorn Chavewanmas Head of Product Engineering

Yodsathorn Chavewanmas is the graduated from The Petroleum and Petrochemical College, Chulalongkorn University. His primary research interests in process simulation, process optimization and life cycle assessment. As a part of his master's thesis, he developed the Life Cycle Assessment software (LCSoft) which have ability to integrate with process simulation software and other useful functions as commercial LCA software can do.



Sustainable Product-Process Engineering Evaluation & Design

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