

# CoilDesigner® Specifications

A sophisticated tool for the design and optimization of air-cooled heat exchangers

## Heat Exchanger Types

- Tube-fin
- Microchannel
- Wire-fin
- Air-to-refrigerant
- Fluid-to-fluid
- Tube-in-tube
- Flat tube

## Refrigerant Options

- All refrigerants available in NIST REFPROP 9.0
- Pure fluids (R134a, R1234yf, R1234ze, CO<sub>2</sub>, etc.) and pre-defined mixtures (R410A, R404A, etc.)
- User-defined refrigerant fluids and mixtures
- Proprietary implementation for popular refrigerant properties gives significant improvement in execution time compared to NIST REFPROP

## Solvers

- Multiple options, depending on need for accuracy or computation time
- 2D fin conduction option with user-defined fin cuts
- Segment by segment modeling approach
- Extensively validated against experimental data

## Parametric Analysis

- Individual, combination, and multiplicative options
- Ability to vary coil dimensions, refrigerant and air side inlet conditions, and tube passes
- Plot results in the program and copy to external applications
- Export data to a spreadsheet for further manipulation and analysis
- Ability to use multiple processors for faster, simultaneous calculations

## Heat Transfer and Pressure Drop Correlations

- Use of empirical correlations to solve for heat transfer, pressure drop and void fraction
- Over 180 built-in correlations implemented in the program, including details and references
- Specific correlations dependent on refrigerant, tube, and/or fin type (i.e. CO<sub>2</sub>, rifflled tube, wavy fin) included
- Data reduction tool allows for back-calculating f and j factors for airside performance based on lab data
- Ability to enter user-defined correlations

## Flexible Tube Circuitry

- Number of tube rows and columns limited only by computer memory
- Model unlimited splits and merges
- Built-in counter-flow circuitry options (tube-fin) and pass-based inputs (microchannels)
- Custom circuitries using mouse clicks on-screen

## Air Side Options

- Multiple fin types (plate, louver, slit, wavy, bare tubes), with wet or dry air
- 2D air maldistribution on coil face area for velocity, temperature and humidity
- Built-in velocity profiles and ability to use CFD velocity profile outputs
- Load a fan curve to solve for air flow rate

## Optimization

- Single and multi-objective genetic algorithms built into the program
- Systematic search of the entire design space defined for optimum coil performance requirements
- Results displayed as a trade-off (Pareto) curve
- New files created for identified design solutions, for further review and analysis
- Unique data visualization built-in to the program to evaluate the optimization results

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## Post Processing and Results

- Detailed results including properties of interest for segments and tubes
- Plots for heat load vs. tubes and circuits and outlet air temperature profile
- 3D view of circuitry and refrigerant temperature distribution
- Ability to export to a spreadsheet for archiving and further analysis

## Interoperability

- Coils saved in portable data format for loading from any application
- External communication interface for .NET platform and Microsoft Excel
- Solvers can be used from other applications (Desktop, Web, Cloud)

## Customization—Available Upon Request

- Customize to suit individual needs, i.e. limiting tube selection, customizing optimization options, etc.
- Integrate with existing in-house tools using the CoilDesigner engine in the background
- Customize the user interface and/or integrate with web platforms

## System Requirements

- Dual core Intel/AMD processor 2.0 GHz
- At least 2 GB RAM; 300 MB hard drive disk space for program installation
- Microsoft Windows Operation System (2000 or higher)
- Microsoft .NET framework 2.0 and 4.0 with complete Windows Updates
- Minimum monitor resolution of 1024 x 768

## Customer Support

- License includes four hours of web-based training
- Unlimited support available via email, phone and web conference
- Assistance with CoilDesigner integration with existing in-house tools and applications

## Pricing and License Agreement

- Annual license, per user
- Price based on number of modules (tube-fin and/or microchannel), number of users, and need for customization
- License renewals provided at a significant discount from the first year price
- Includes unlimited support, web-based training, and all program updates

**Demonstration and training videos are available on our website and YouTube channel.**

Contact us today at [sales@optimizedthermalsystems.com](mailto:sales@optimizedthermalsystems.com) to schedule an individualized web demonstration, obtain additional information regarding customization capability, and request a quote.



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