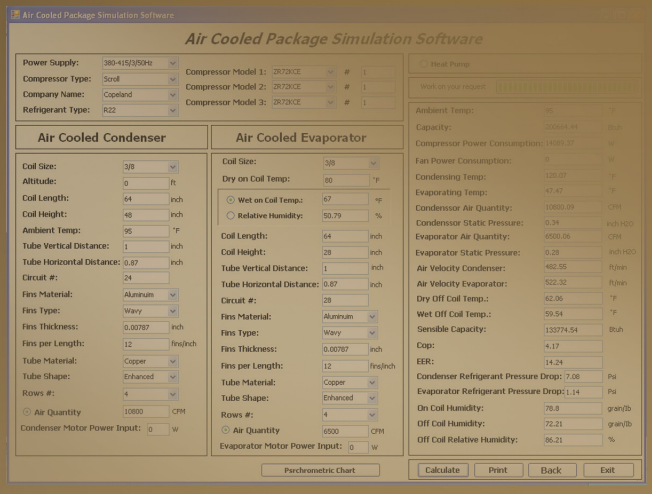
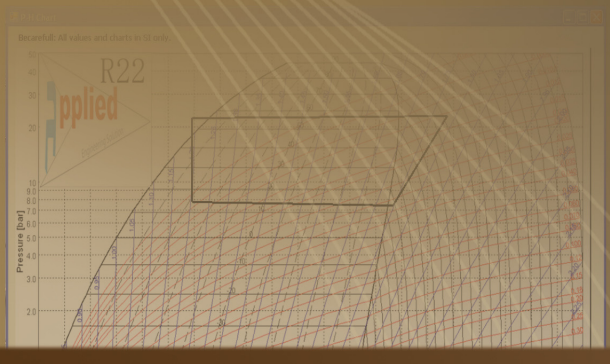
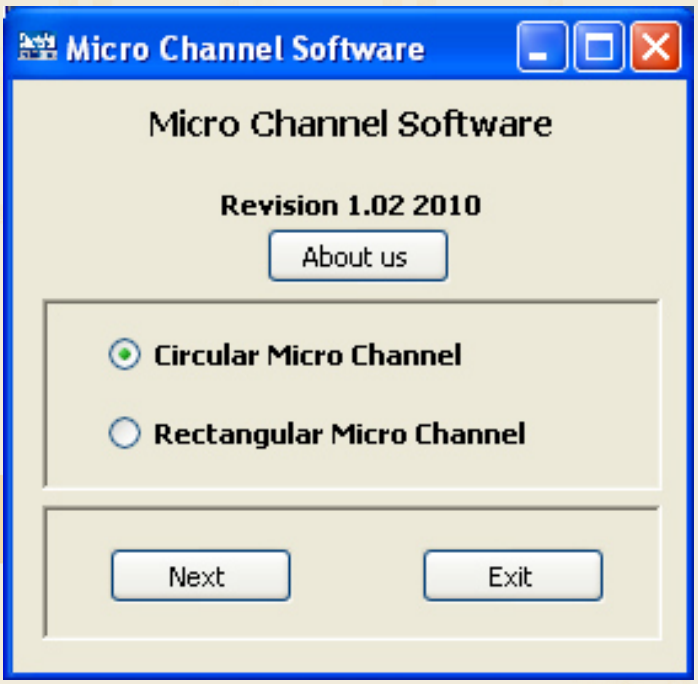
# Applied Engineering solutions

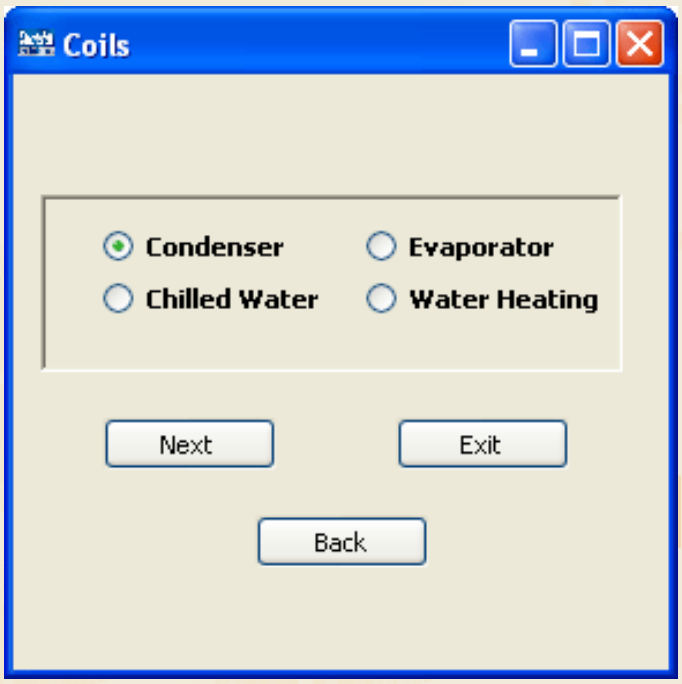
## Micro Channel Design Software



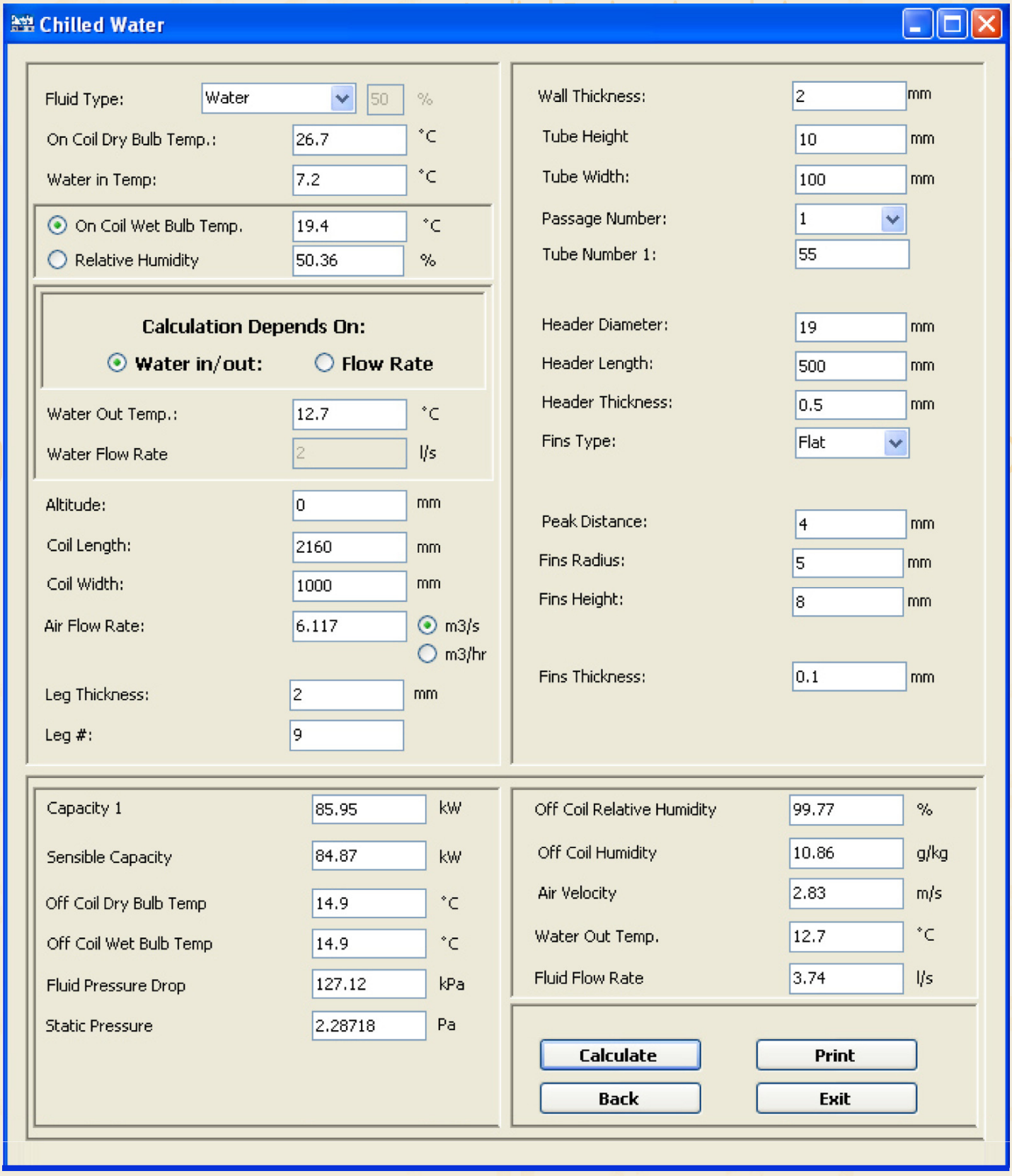



Micro channel design software is done for engineers (Design, consultant, contracor, researcher & developer), it have all the facility required by the user with professional & complete technical report, so we did this software for miro channel design & performance calculations for many applications such condenser, evaporator, chilled water, & water heating, many features are available here which not available for any other software such as:

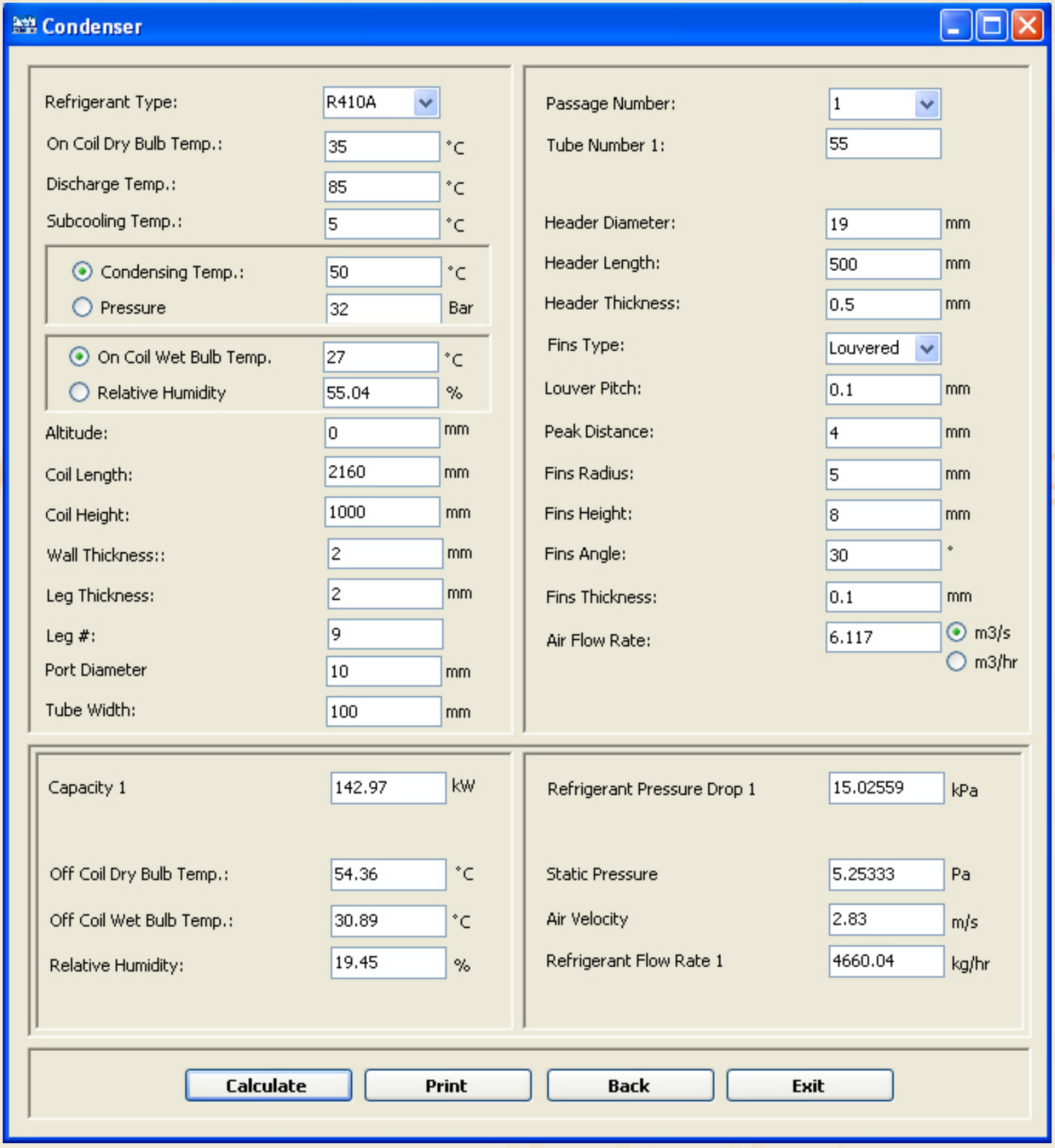


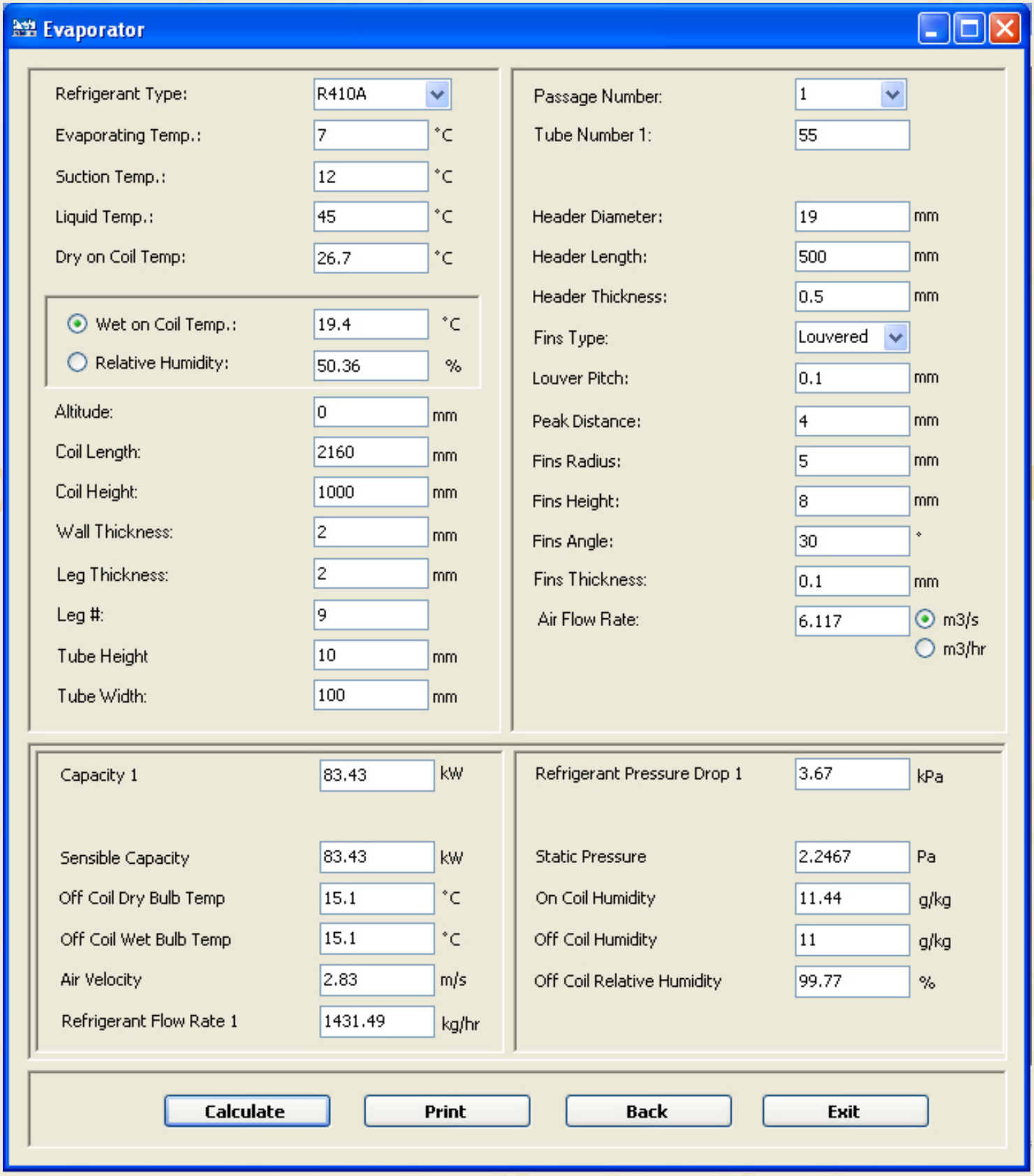

Unit with SI or Imperial
Selection depending on wet bulb temperature or relative humidity
Selection depending on Fluid in / out temperature or Flow rate (Only for Chilled water & Water Heating Applications).
Many micro channel features facility.
Wavy, lanced, rectangular, louver & Flat fins type
Circular & Rectangular micro channel shape
Wall thickness, leg thickness, leg numbers
Port diameter, tube width, tube height
Passage number, tube numbers 1 or 2 as per user desired.
Header length, diameter, & thickness Fins radius, thickness, peak distance, height & angle where applicable
Many refrigerants (R22, R407C, R404A, R134A & R410A)
Many fluid application for (water cooling & water heating applications) such as ethylene & propylene fluid at different concentrations.
Fouling factor selection Altitude above sea level
This software designed for Air conditioning & refrigeration micro channel dsign.Selection facility which give the user all possibility of coil design at required capacity.
Professional report & many other things.




Applied Engineering solutions




Applied Engineering solutions




Applied Engineering solutions

Applied Engineering solutions

## Water Heating

| | | |
|---|---|---|
| Dry on Coil Temp.: | 26.7 | °C |
| Water In Temp.: | 50 | °C |
| (•) Wet On Coil Temp. | 19.4 | °C |
| ( ) Relative Humidity | 50.36 | % |

**Calculation Depends On:**

( ) **Water in/out:** (•) **Flow Rate**

| | | |
|---|---|---|
| Water Out Temp.: | 40 | °C |
| Water Flow Rate: | 2 | l/s |
| Altitude: | 0 | mm |
| Coil Length: | 2160 | mm |
| Coil Width: | 1000 | mm |
| Wall Thickness: | 2 | mm |
| Leg Thickness: | 2 | mm |
| Leg #: | 9 | |
| Port Diameter | 10 | mm |
| Tube Width: | 100 | mm |

| | | |
|---|---|---|
| Passage Number: | 1 | |
| Tube Number 1: | 55 | |
| Fluid: | Water | |
| Header Diameter: | 19 | mm |
| Header Length: | 500 | mm |
| Header Thickness: | 0.5 | mm |
| Fins Type: | Flat | |
| Peak Distance: | 4 | mm |
| Fins Radius: | 5 | mm |
| Fins Height: | 8 | mm |
| Fins Thickness: | 0.1 | mm |
| Air Flow Rate: | 6.117 | (•) m3/s ( ) m3/hr |

| | | |
|---|---|---|
| Capacity 1: | 102.04 | kW |
| Off Coil Dry Bulb Temp.: | 40.52 | °C |
| Off Coil Wet Bulb Temp.: | 23.65 | °C |
| Water out Temp.: | 37.79 | °C |

| | | |
|---|---|---|
| Fluid Pressure Drop: | 39.18 | kPa |
| Static Pressure: | 2.36862 | Pa |
| Air Velocity: | 2.83 | m/s |
| Relative Humidity: | 23.01 | % |
| Fluid Flow Rate: | 2 | l/s |

Calculate | Print | Back | Exit

Applied Engineering solutions

## Input data:

-SI or Imperial unit measurements.
-Condenser, DX Evaporator, Chilled water or Water heating applications.
-For Evaporator application or Chilled water applications User can use calculation based on wet bulb temperature or Relative humidity.
-For Chilled water & Water heating applications User can select calculation based on Fluid in/out Temperature or Fluid Flow rate upon his desired.
-Altitude above sea level.
-On coil dry bulb temp., depending on application.
-On coil wet bulb temp., depending on application.
-Evaporating temp., Discharge temp., water in depending on flow rate.
-Suction temp., condensing temp., water out or flow rate depending on application.
-Coil Length.
-Coil Height.
-Wall thickness
-Leg thickness
-Leg numbers
-Tube height or port diamter
-Tube width
-Passage numbers
-Tube number
-Header diameter
-Header Length
-Header thickness
-Fins type (Flat, wavy, lanced, rectangular, louvered)
-Louver pitch
-Peak distance
-Fins radius
-Fins height
-Fins angle
-Fins thickness
-Air flow rate
-Refrigerant (R134A, R22, R404A, R407C & R410A), (depending on application).
-Fluid (Water, Ethylene & Propylene), (depending on application).

## Output:

-Total capacity.
-Sensible capacity, (where applicable).
-Off coil dry & wet bulb temp. , (where applicable).
-Fluid or refrigerant pressure drop.
-Air static pressure.
-Flow rate, (where applicable).
-Air velocity.
-Humidity, (where applicable).
-Relative humidity, (where applicable).

# Micro Channel Software

## Chilled Water

## INPUT DATA

| | | |
|---|---|---|
| Fluid Type: | Water | |
| On Coil Dry Bulb Temp.: | 26.7 | ˚C |
| On Coil Wet Bulb Temp.: | 19.4 | ˚C |
| Relative Humidity: | 50.36 | % |
| Water In Temp.: | 7.2 | ˚C |
| Water Out Temp.: | 12.7 | ˚C |
| Altitude: | 0 | mm |
| Coil Length: | 2160 | mm |
| Coil Width: | 1000 | mm |
| Passage Number: | 1 | |
| Tube Number 1: | 55 | |
| Air Flow Rate: | 6.117 | m3/s |

| | | |
|---|---|---|
| Tube Height: | 10 | mm |
| Tube Width: | 100 | mm |
| Wall Thickness: | 2 | mm |
| Leg Thickness: | 2 | mm |
| Leg #: | 9 | |
| Header Diameter: | 19 | mm |
| Header Length: | 500 | mm |
| Header Thickness: | 0.5 | mm |
| Fins Type: | Flat | |
| Peak Distance: | 4 | mm |
| Fins Radius: | 5 | mm |
| Fins Height: | 8 | mm |
| Fins Thickness: | 0.1 | mm |

## OUTPUT DATA

| | | |
|---|---|---|
| Capacity 1: | 85.95 | kW |
| Sensible Capacity: | 84.87 | kW |
| Off Coil Dry Bulb Temp.: | 14.9 | ˚C |
| Off Coil Wet Bulb Temp.: | 14.9 | ˚C |
| Water out Temp.: | 12.7 | ˚C |

| | | |
|---|---|---|
| Fluid Pressure Drop: | 127.12 | kPa |
| Static Pressure: | 2.28718 | Pa |
| Off Coil Relative Humidity: | 99.77 | % |
| Off Coil Humidity: | 10.86 | g/kg |
| Air Velocity: | 2.83 | m/s |
| Fluid Flow Rate: | 3.74 | l/s |

# Micro Channel Software

## Water Heating

### INPUT DATA

| | | |
|---|---|---|
| Fluid: | Water | |
| Dry On Coil Temp.: | 26.7 | ˚C |
| Wet On Coil Temp.: | 19.4 | ˚C |
| Relative Humidity: | 50.36 | % |
| Water In Temp.: | 50 | ˚C |
| Water Flow Rate: | 2 | l/s |
| Altitude: | 0 | mm |
| Coil Length: | 2160 | mm |
| Coil Width: | 1000 | mm |
| Passage Number: | 1 | |
| Tube Number 1: | 55 | |
| Port Diameter: | 10 | mm |
| Tube Width: | 100 | mm |
| Air Flow Rate: | 6.117 | m3/s |

| | | |
|---|---|---|
| Wall Thickness: | 2 | mm |
| Leg Thickness: | 2 | mm |
| Leg #: | 9 | |
| Header Diameter: | 19 | mm |
| Header Length: | 500 | mm |
| Header Thickness: | 0.5 | mm |
| Fins Type: | Flat | |
| Peak Distance: | 4 | mm |
| Fins Radius: | 5 | mm |
| Fins Height: | 8 | mm |
| Fins Thickness: | 0.1 | mm |

### OUTPUT DATA

| | | |
|---|---|---|
| Capacity 1: | 102.04 | kW |
| Off Coil Dry Bulb Temp.: | 40.52 | ˚C |
| Off Coil Wet Bulb Temp.: | 23.65 | ˚C |
| Fluid Flow Rate: | 2 | l/s |

| | | |
|---|---|---|
| Fluid Pressure Drop: | 39.18 | kPa |
| Static Pressure: | 2.36862 | Pa |
| Air Velocity: | 2.83 | m/s |
| Relative Humidity: | 23.01 | % |
| Water out Temp.: | 37.79 | ˚C |

# Micro Channel Software

## Condenser

## INPUT DATA

| | | | | | |
|---|---|---|---|---|---|
| Refrigerant Type: | R410A | | Port Diameter: | 10 | mm |
| On Coil Dry Bulb Temp.: | 35 | ˚C | Tube Width: | 100 | mm |
| Discharge Temp.: | 85 | ˚C | Wall Thickness: | 2 | mm |
| Condensing Temp.: | 50 | ˚C | Leg Thickness: | 2 | mm |
| Sub Cooling Temp.: | 5 | ˚C | Leg #: | 9 | |
| On Coil Wet Bulb Temp.: | 27 | ˚C | Header Diameter: | 19 | mm |
| Relative Humidity: | 55.04 | % | Header Length: | 500 | mm |
| Altitude: | 0 | mm | Header Thickness: | 0.5 | mm |
| Coil Length: | 2160 | mm | Fins Type: | Louvered | |
| Coil Height: | 1000 | mm | Louver Pitch | 0.1 | mm |
| Passage Number: | 1 | | Peak Distance: | 4 | mm |
| Tube Number 1: | 55 | | Fins Radius: | 5 | mm |
| | | | Fins Height: | 8 | mm |
| Air Flow Rate: | 6.117 | m3/s | Fins Angle | 30 | ˚ |
| | | | Fins Thickness: | 0.1 | mm |

## OUTPUT DATA

| | | | | | |
|---|---|---|---|---|---|
| Capacity 1: | 142.97 | kW | Refrigerant Pressure Drop 1: | 15.02559 | kPa |
| Off Coil Dry Bulb Temp.: | 54.36 | ˚C | Static Pressure: | 5.25333 | Pa |
| Off CoilWet Bulb Temp.: | 30.89 | ˚C | Air Velocity: | 2.83 | m/s |
| Refrigerant Flow Rate 1: | 4660.04 | kg/hr | Relative Humidity: | 19.45 | % |

# Micro Channel Software

## Evaporator

## INPUT DATA

| | | | | | |
|---|---|---|---|---|---|
| Refrigerant Type: | R410A | | Tube Height: | 10 | mm |
| Evaporating Temp.: | 7 | °C | Tube Width: | 100 | mm |
| Suction Temp.: | 12 | °C | Wall Thickness: | 2 | mm |
| Liquid Temp.: | 45 | °C | Leg Thickness: | 2 | mm |
| Dry On Coil Temp.: | 26.7 | °C | Leg #: | 9 | |
| Wet On Coil Temp.: | 19.4 | °C | Header Diameter: | 19 | mm |
| Relative Humidity: | 50.36 | % | Header Length: | 500 | mm |
| Altitude: | 0 | mm | Header Thickness: | 0.5 | mm |
| Coil Length: | 2160 | mm | Fins Type: | Louvered | |
| Coil Width: | 1000 | mm | Louver Pitch | 0.1 | mm |
| Passage Number: | 1 | | Peak Distance: | 4 | mm |
| Tube Number 1: | 55 | | Fins Radius: | 5 | mm |
| | | | Fins Height: | 8 | mm |
| Air Flow Rate: | 6.117 | m3/s | Fins Angle | 30 | ° |
| | | | Fins Thickness: | 0.1 | mm |

## OUTPUT DATA

| | | | | | |
|---|---|---|---|---|---|
| Capacity 1: | 83.43 | kW | Refrigerant Pressure Drop 1: | 3.67 | kPa |
| Sensible Capacity: | 83.43 | kW | Static Pressure: | 2.2467 | Pa |
| Off Coil Dry Bulb Temp.: | 15.1 | °C | Off Coil Relative Humidity: | 99.77 | % |
| Off Coil Wet Bulb Temp.: | 15.1 | °C | On Coil Humidity: | 11.44 | g/kg |
| Air Velocity: | 2.83 | m/s | Off Coil Humidity: | 11 | g/kg |
| Refrigerant Flow Rate 1: | 1431.49 | kg/hr | | | |

# Summary

**This software gives the user all configuration & specifications for micro channel coil design & manufacturing.**

**User can control & study the affect of all variables which will affect on the micro channel coil performance.**

**The ability of selection relative humidity or wet bulb temperature calculation scenario where applicable.**

**The possibility for entering water flow rate or water in/out temperature where applicable.**

**User can use easily his preferred unit measurement SI or Imperial.**

**The ability of selection suitable fluid (Ethylene, Propylene or Water) with any concentration percentage.**

**All above data are extracted with professional technical report.**

Applied Engineering solutions

Applied Engineering solutions
Applied Engineering solutions
Applied Eng
Applied Engineering solutions
Applied Engineering solutions
Applied Eng

## Contact us:

Soheil Assayed for Applied Engineering Solutions

applied_eng@yahoo.com
saleapplied_eng@yahoo.com
sales@applied-eng.com
www.applied-eng.com

Mobile : +962799733254 - Telefax: +96265604411
P.O.Box “212827”, Amman – 11121 - Jordan