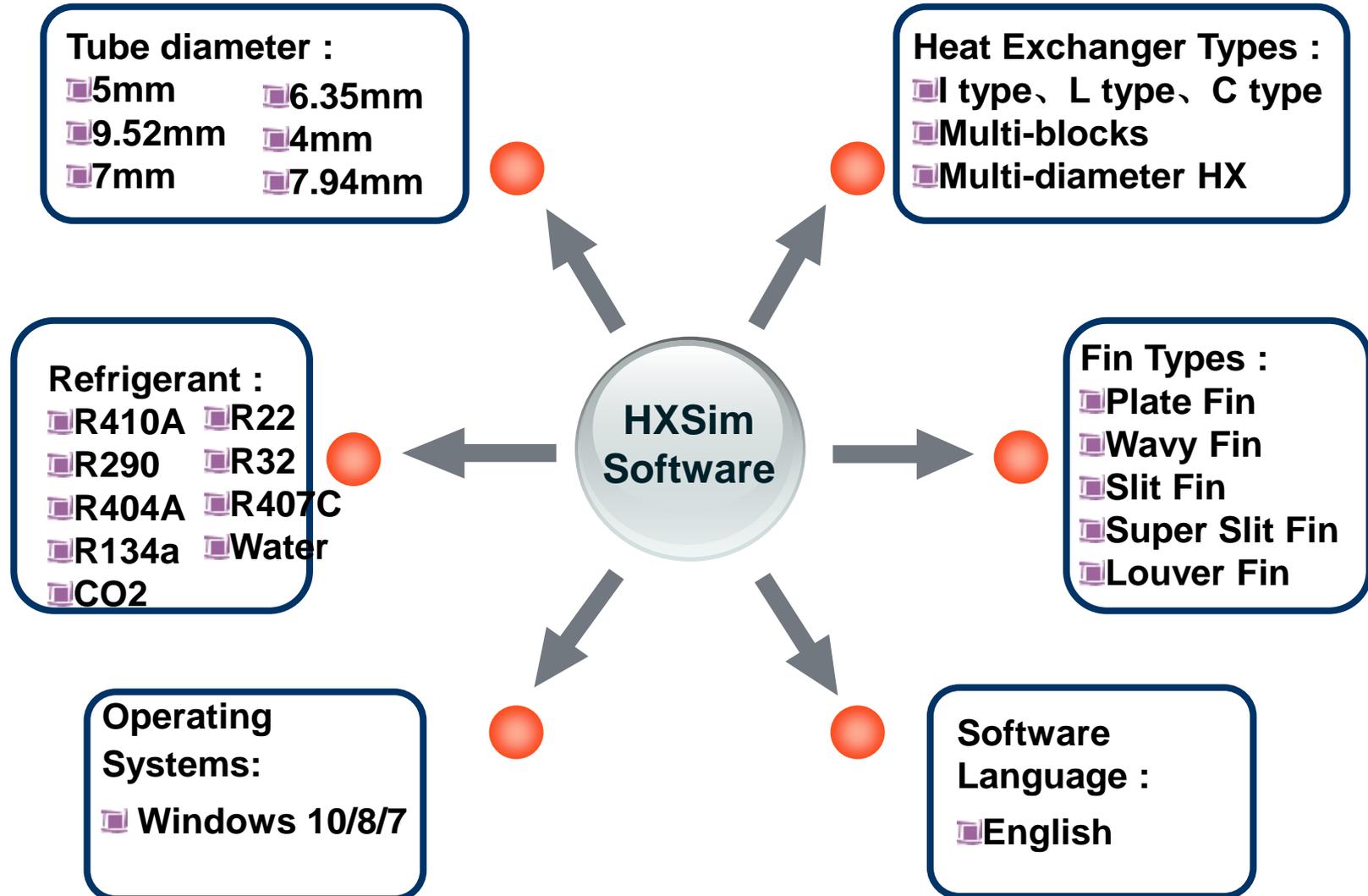


HXSim Simulation Software GETTING STARTED

V3.3
2021

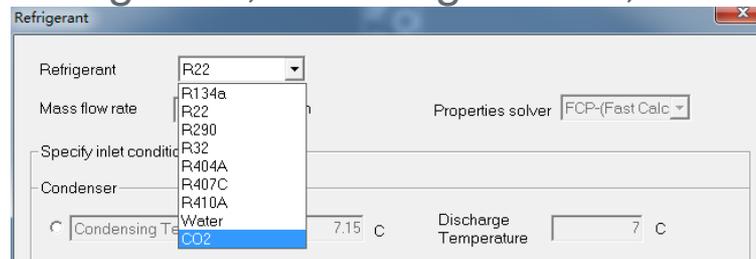




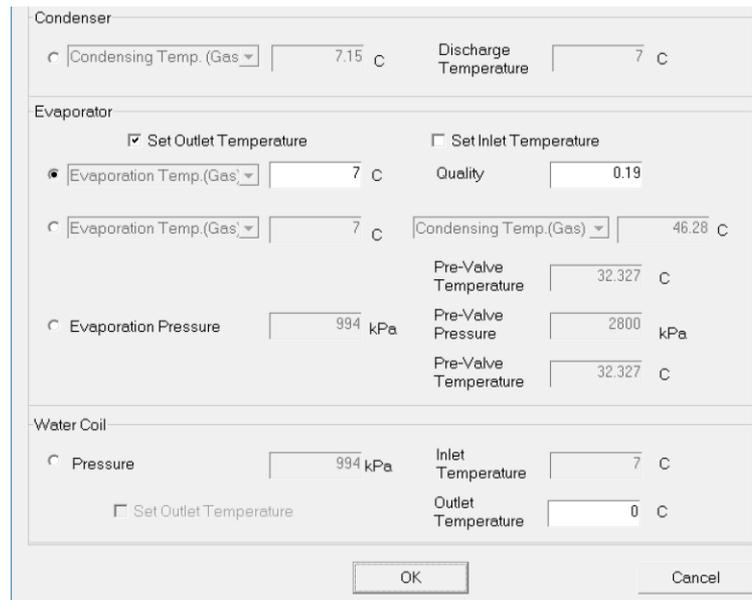
Improvement of Latest Version HXSim v3.3

Cu

- ✓ Add 5 kinds of new refrigerant, including R404A, R407C, R134a, Water, CO₂.



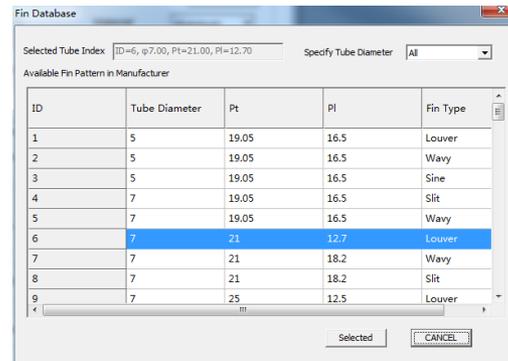
- ✓ Add different heat exchanger roles, including condenser, evaporator and water coil.



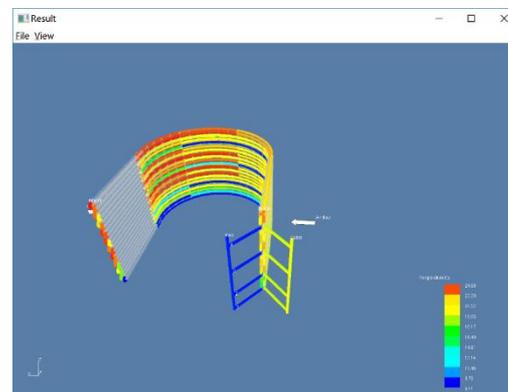
Improvement of Latest Version HXSim v3.3

Cu

- ✓ Add 5 kinds of new 5mm tubes and 12 kinds of 5mm fins. And switch to database.



- ✓ Optimize the algorithm to make calculation faster. And update the graphical display to show the different temperature.



Installation and Registration

Cu

- ✓ Run HXSim.msi, the following dialog will pop out for register as shown in Fig.1. Send the registered ID via email to yuli@craheta.org, you will get the registered code within 1-2 days.
- ✓ Input the registered code as Fig.2. Click the button “Register”, a dialog of “Succeed to login” will pop out to finish the installation.

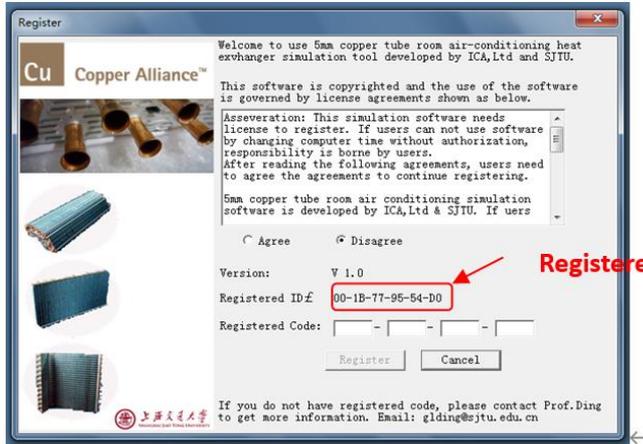


Fig.1

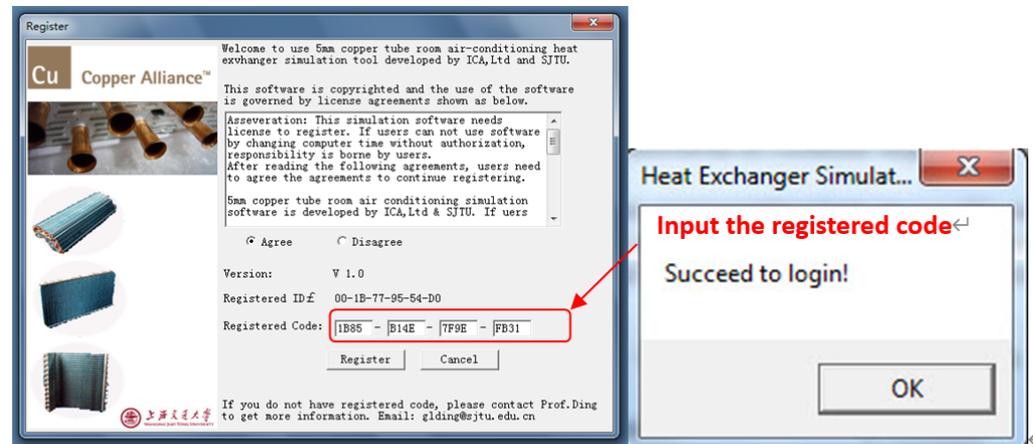
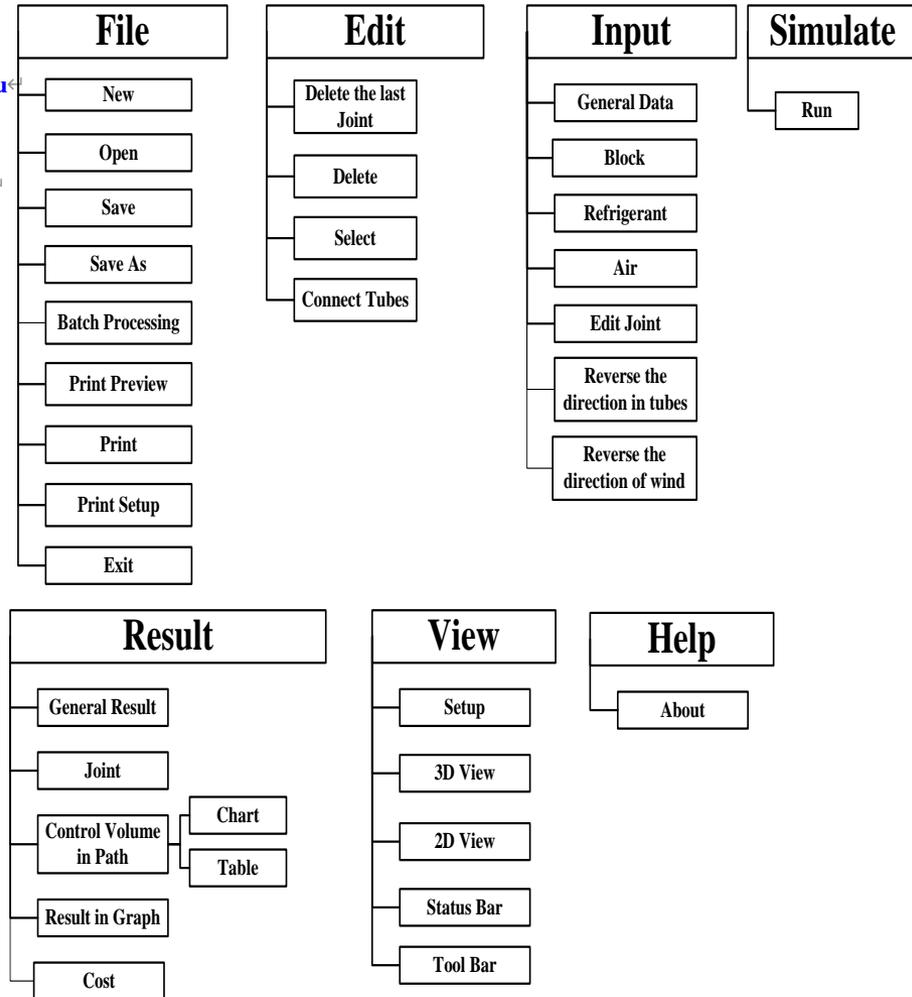
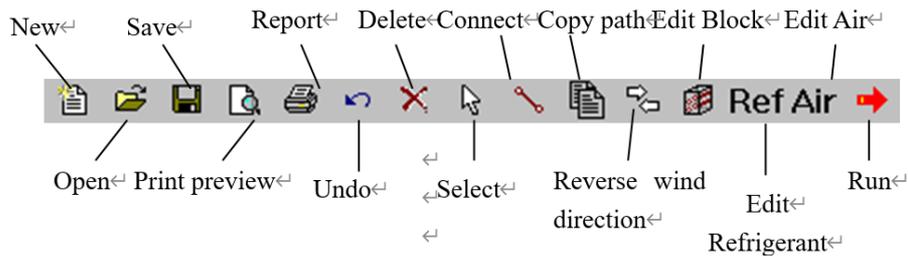
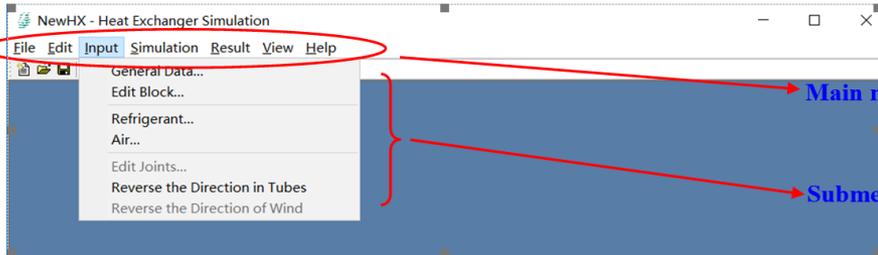


Fig2

Main Menu and Toolbar

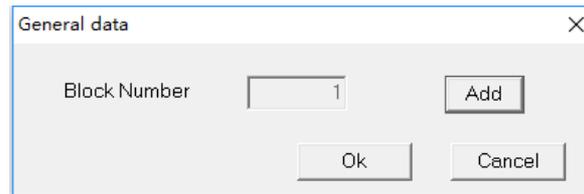
Cu



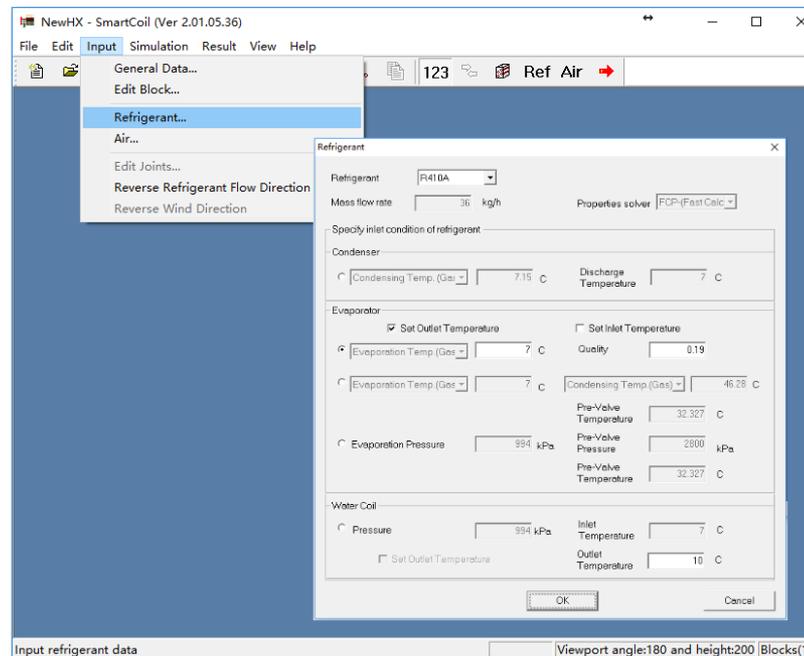
Data Input

Cu

- ✓ General data input window



- ✓ Refrigerant status input window



Data Input

Cu

✓ Inlet airflow input window

NewHX - Heat Exchanger Simulation

File Edit **Input** Simulation Result View Help

General Data...
Edit Block...
Refrigerant...
Air...
Edit Joints...
Reverse the Direction in T...
Reverse the Direction of V...

Inlet air

Block 1

Velocity | Dry-bulb temperature | Wet-bulb temperature | Pressure

Set values

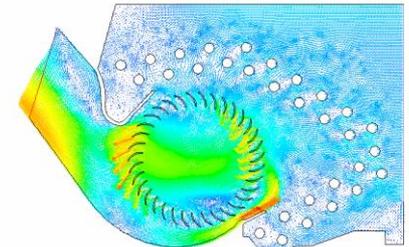
Set values of the selected cells
Unit.(m/s) Update

Set average air flow rate
0 Unit.(m3/h) Update

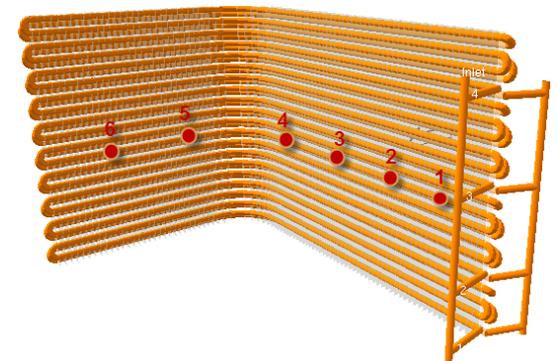
Column	CV1	CV2	CV3
1	1.000	1.000	1.000
2	1.000	1.000	1.000
3	1.000	1.000	1.000
4	1.000	1.000	1.000
5	1.000	1.000	1.000
6	1.000	1.000	1.000
7	1.000	1.000	1.000
8	1.000	1.000	1.000
9	1.000	1.000	1.000
10	1.000	1.000	1.000
11	1.000	1.000	1.000
12	1.000	1.000	1.000

OK Cancel

Input Air data Viewport angle:0 and height: Bloc



Velocity Vectors Colored By Velocity Magnitude (m/s)



Data Input

Cu

✓ Heat exchanger dimension input window

Input

Block1

Fin

Fin Info ID=6, φ7.00, Pt=21.00, Pl=12.7 Fins

Fin type LouverFin Material: Aluminum

Fin pitch 1.8 mm Thickness: 0.105 mm

Continuous fin Separated fin

Tubes

Block type I type Holes 20 Rows 2

Tube Arrangement Staggered-AaA Tube Type

Height 420 mm Depth 25.4 mm

Set sub block

Sub block Subordinates to No

Relative height to main block 0 mm Relative angle to main block 0

Air Flow

Direction of Air Flow From Right to Left

Section

Length 500 mm Control volume number 3

Ok Cancel

(a) I type

Input

Block1

Fin

Fin Info ID=6, φ7.00, Pt=21.00, Pl=12.7 Fins

Fin type LouverFin Material: Aluminum

Fin pitch 1.8 mm Thickness: 0.105 mm

Continuous fin Separated fin

Tubes

Block type L type Holes 20 Rows 2

Tube Arrangement Staggered-AaA Tube Type

Height 420 mm Depth 25.4 mm

Set sub block

Sub block Subordinates to No

Relative height to main block 0 mm Relative angle to main block 0

Air Flow

Direction of Air Flow From Right to Left

First Section

Length 500 mm Control volume number 3

Second section

Inner Radius 100 mm Input Style Length of Each Projection

Angle 90° Control volume number 3

Length of Each Section ?

Third section

Length 200 mm Control volume number 3

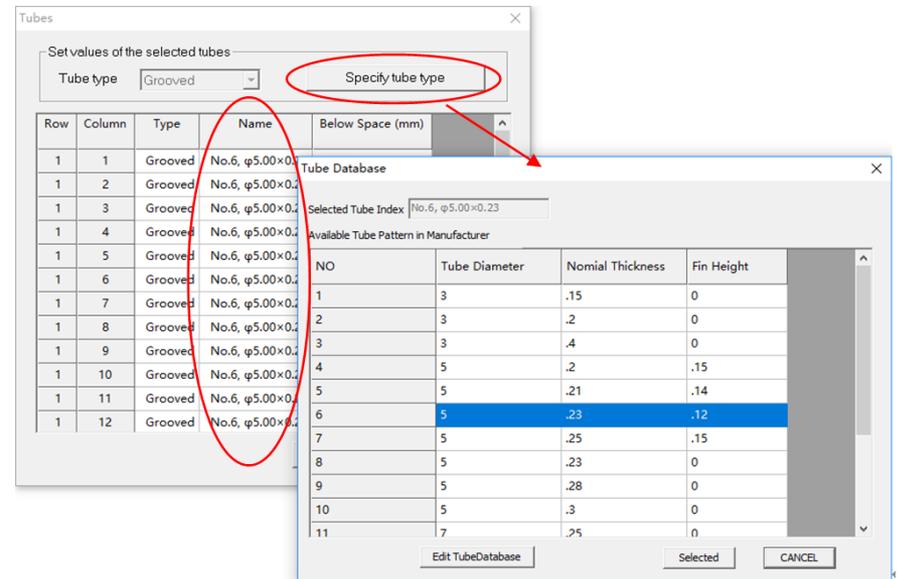
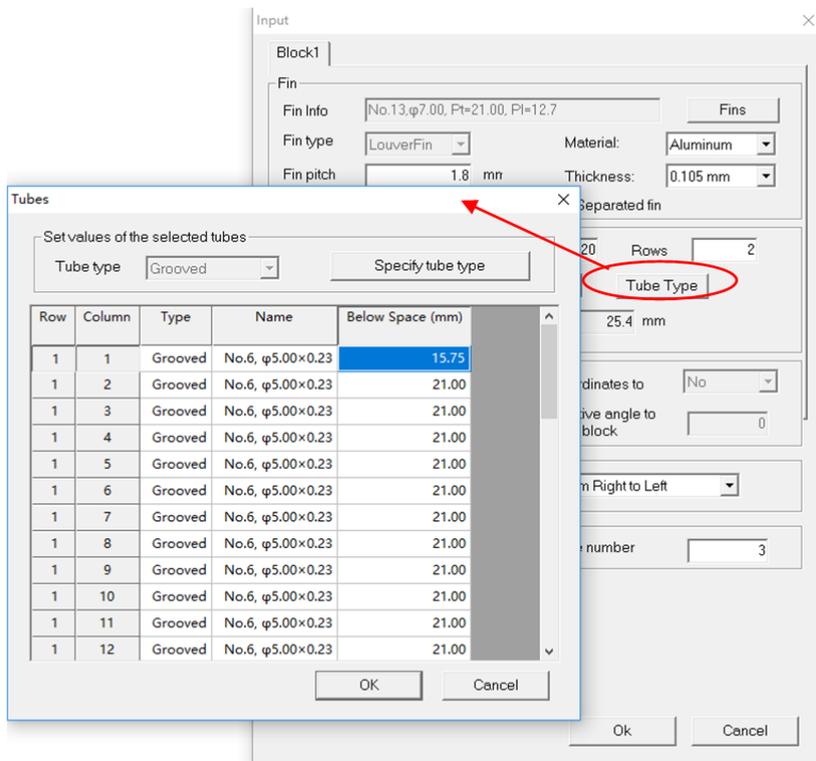
Ok Cancel

(b) L type

Data Input



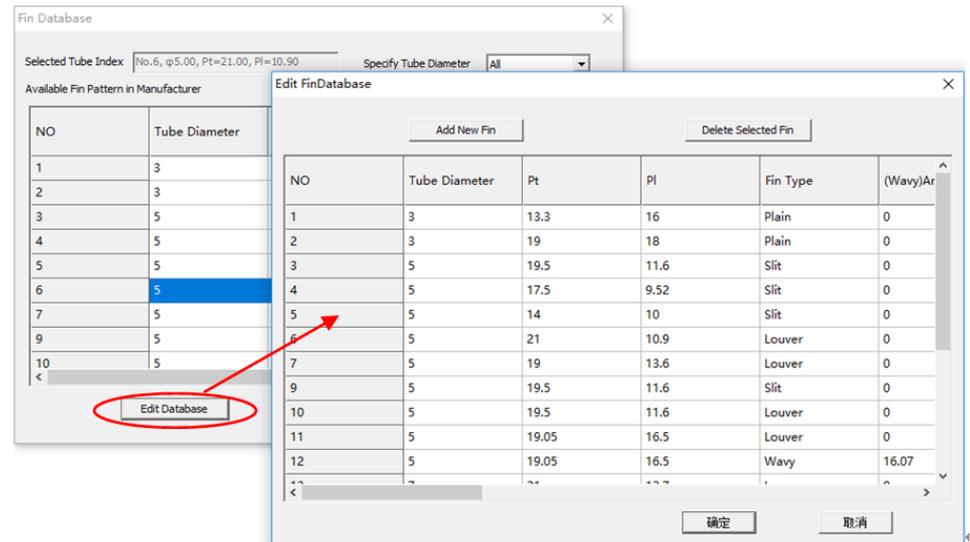
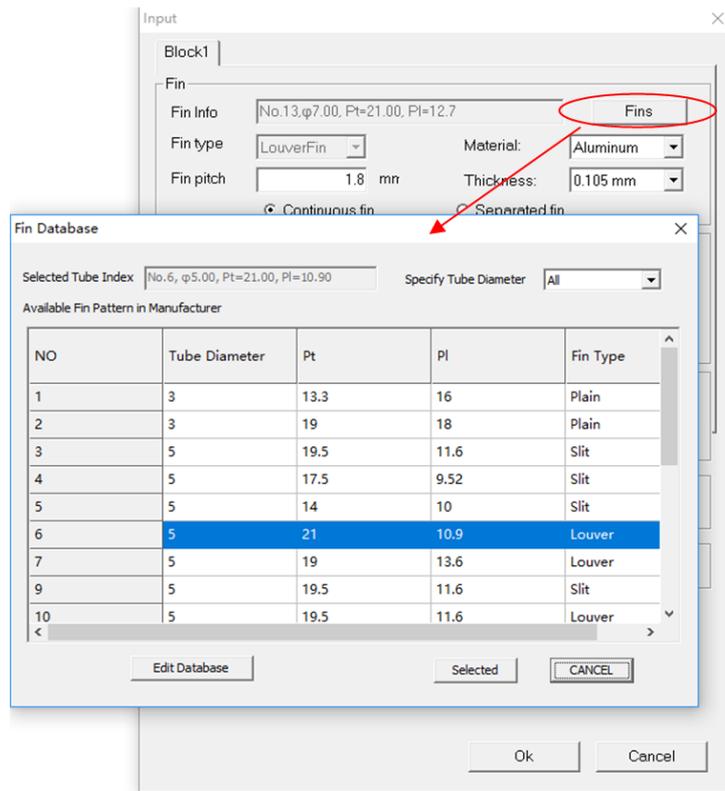
✓ Tube structure input window



Data Input

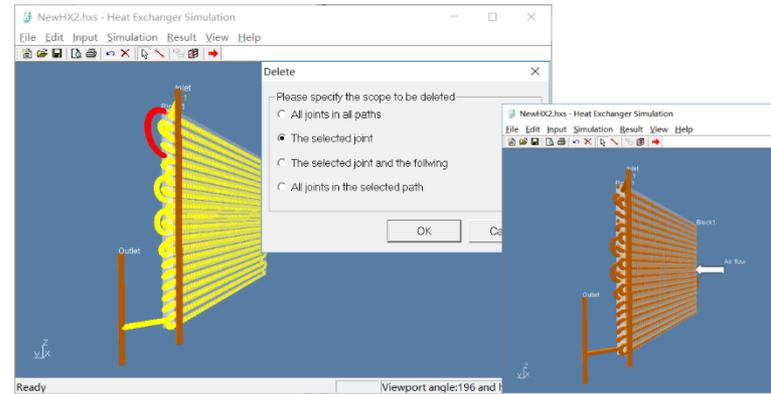
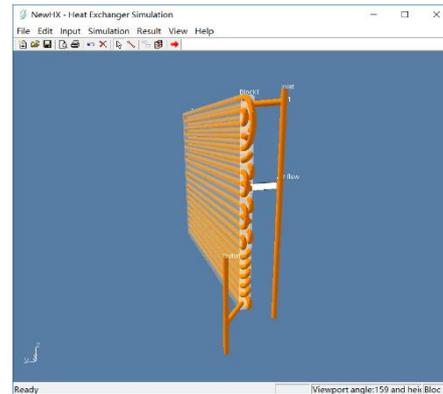
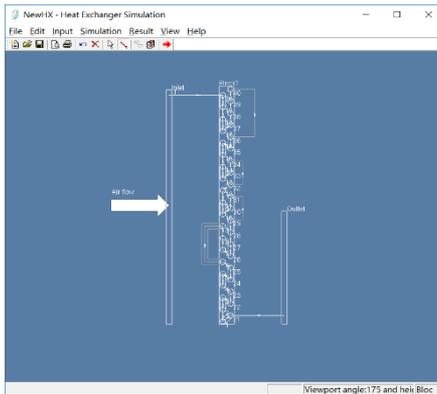
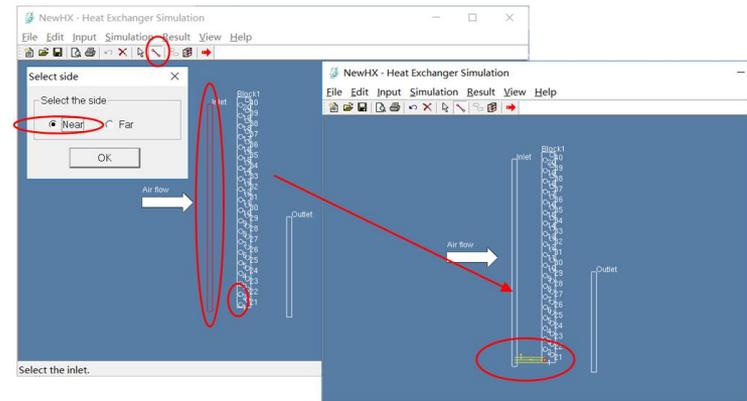
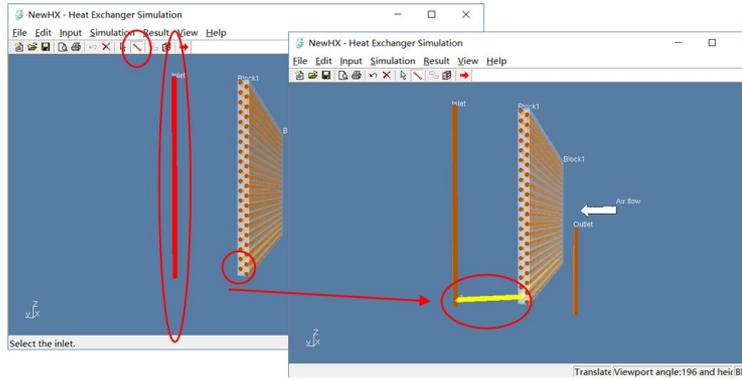
Cu

✓ Fin type input window



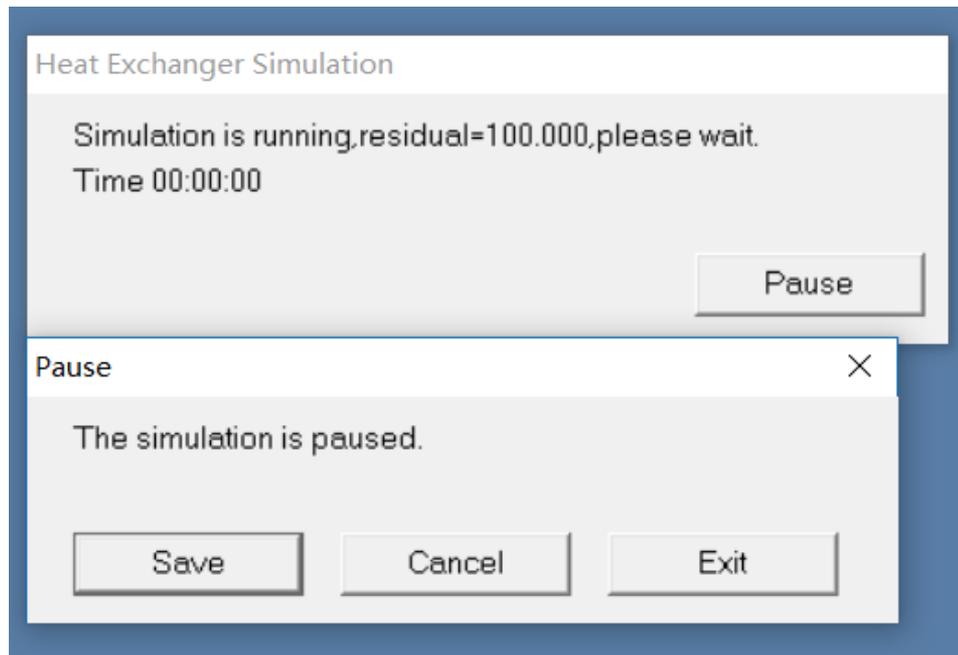
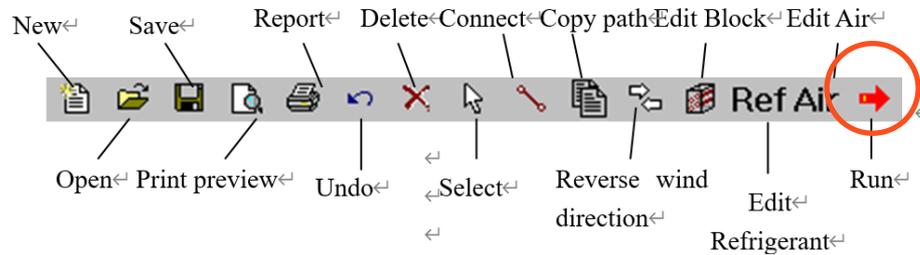
Connect Tubes

Cu



Run a Simulation

Cu



Simulation Results

Cu

✓ General results

Export Report

Choose Results Template

Condenser Template
 Evaporator Template
 Water Coil Template

Simulation Results

Click "Print Results" to print the results. Double click a cell to edit it.

Customer			
Date			
Project			
COIL SIDE			
Fin Type	Louver	Utilized Tubes	9
Fin Material	Aluminum	Non Utilized Tubes	31
Fin Spacing [mm]	1.80	Circuits	1
Fin Thickness [mm]	0.105	Tubes Per Circuit	9.00
Tube Type	Grooved	Coil Length [mm]	500.00
Tube Material	Copper	Coil Depth [mm]	25.40
Tube Dimension [mm]	7.00*0.28*0.10	Coil Height [mm]	420.00
Holes	20	Outer Area [m2]	1.227
Rows	2	Inner Area [m2]	0.091
Tube Vertical Space [mm]	21.00	Coil Face Area [m2]	0.21
Tube Horizontal Space [mm]	12.70	Inner Volume [L]	0.147
Distributor [mm]	9.5	Header Out [mm]	9.5
AIR SIDE		REFRIGERANT SIDE	
Air Inlet DB. Temp. [°C]	27.0	Refrigerant	R410A
Relative Humidity %	47.0	Evaporator Temp [°C]	7.007
Air Outlet DB. Temp. [°C]	23.4	Superheating [°C]	0.000
Relative Humidity %	54.9	Quality / Mass Fraction	0.188
Air Flow [m3/h]	749.6	Mass Flow [kg/h]	36.0
Air Mass Flow [kg/h]	962.8	Coil Pressure Drop [kPa]	7.877
Frontal Velocity [m/s]	1.0	Outlet Pressure [kPa]	989.588
Air Pressure Drop [Pa]	4.1	Ref. Charge [kg]	0.03
Atmospheric Pressure [kPa]	101.3	Ref. Side H.T.C. [W/m2*K]	5623.211
Air Side H.T.C. [W/m2*K]	118.983		

Print Results Close

General results

Heat Exchange	4940.223 W	Print	
Refr Pressure Drop	43.025 kPa	Save As CSV	
Air Pressure Drop	35.8 Pa		
A_ref	0.622 m ²	h_ref	4796.565 W/m2K
Q_2ph	0.000 W	h_2ph	0.000 W/m2K
Q_l	-4936.193 W	h_l	4796.565 W/m2K
Q_g	0.000 W	h_g	0.000 W/m2K

Refrigerant of inlet

Pressure	600.000 kPa	Temperature	7.000 C
Enthalpy	30.080 kJ/kg	Mass Quality	-0.311
Subcooling	154.481 C	Mass Flow Rate	219.722 g/s

Refrigerant of outlet

Pressure	556.975 kPa	Temperature	12.368 C
Enthalpy	52.560 kJ/kg	Mass Quality	-0.292
Subcooling	145.890 C		

Block1

Heat Capacity	4936.176 W
Air flow rate	680.219 m3/h
Heat transfer area	8.437 m ²
Heat transfer coefficient	95.199 W/m2K

Details

Air of inlet

Tdb	27.000 C	Twb	19.530 C	Pressure	101.300 kPa
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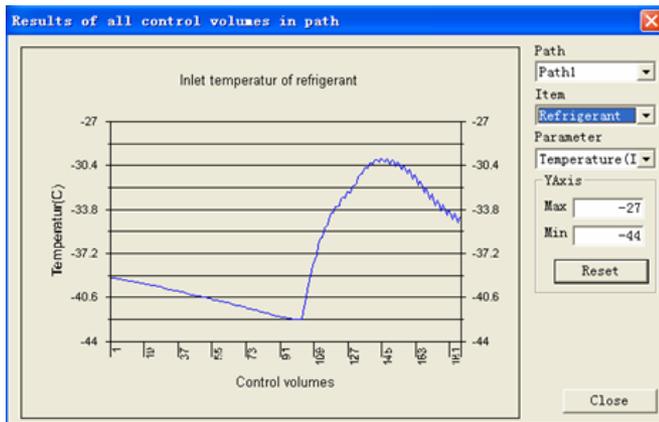
Air of outlet

Tdb	11.525 C	Twb	11.518 C	Pressure	101.264 kPa
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Simulation Results

Cu

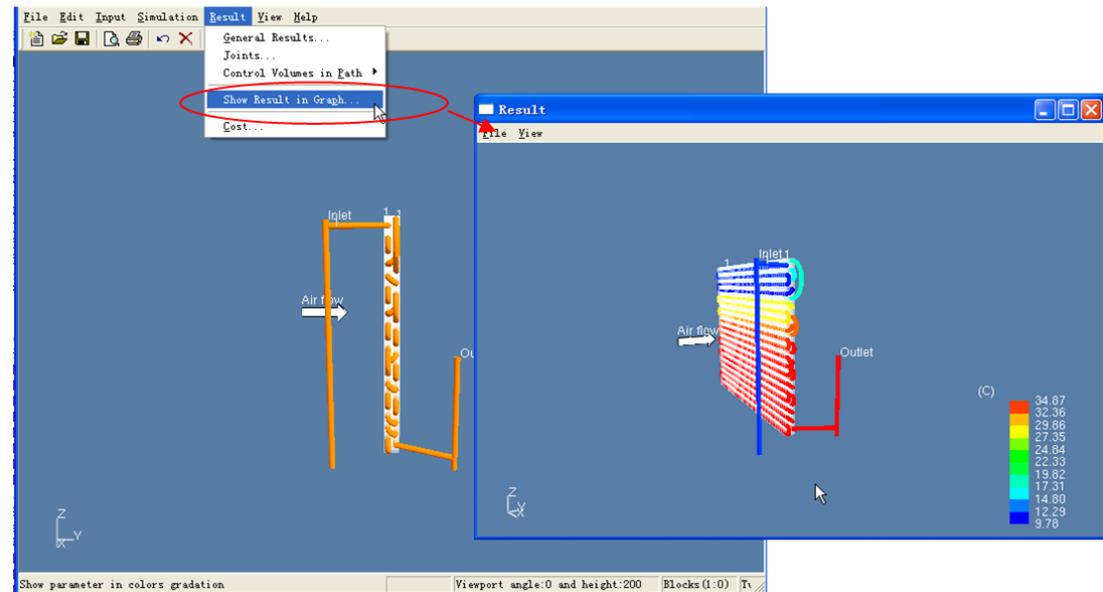
✓ Simulation results of path



Result in all control volumes in path-refrigerant

frigerant weight: 10.636 g Heat exchange: 152.605 W

Column	Control volume	Temperature (In) (C)	Temperature (Out) (C)
1	3	-39.09	-39.10
1	2	-39.10	-39.10
1	1	-39.10	-39.11
12	2	-39.16	-39.17
12	1	-39.17	-39.18
12	2	-39.18	-39.18
2	3	-39.24	-39.25
2	2	-39.25	-39.25
2	1	-39.25	-39.26
13	2	-39.32	-39.32
13	2	-39.32	-39.33
13	3	-39.33	-39.34
3	3	-39.40	-39.41



Thank you

For more information, please contact

kerry.song@copperalliance.org