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KULI components
零部件模块介绍

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What is KULI components?
什么是KULI零部件模块?

Features 特点

- **Comparison, enhancements**
  比较和增强
  - Scaling of components
    对零部件进行缩放
  - Comparison to reference components
    与参考零部件进行对比
  - Comparison of key values of different components
    比较不同零部件之间的关键参数

- **Extended data handling**
  扩展数据处理方式
  - Extended input options
    扩展输入方式

Some typical examples solved by KULI components
可以用KULI零部件模块解决的一些问题

- A heat exchanger is measured on a test bench with a mass flow of the coolant up to 2.7 kg/s.
  一个换热器采用了最高质量流量2.7kg/s在台架上进行了测试
  - What is the performance with a coolant mass flow of 3.5 kg/s?
    那它在3.5kg/s质量流量下会怎么表现?
- A heat exchanger is measured with specific dimensions.
  一个换热器采用了某个尺寸进行测量
  - What is the performance with other dimensions?
    它在其它尺寸下的表现会如何?
  - What pressure drop can be found with new dimensions of the heat exchanger?
    在这个新尺寸下的压力损失又是怎样的?
- There are several types of heat exchangers available. 当您有好几个散热器
  - What heat exchanger has the best performance for some operating points (core size has to be the same)?
    在同一尺寸下，哪个散热器在某些工况下表现最佳?
- An oil cooler is measured with one type of oil.
  某个油冷器采用了某种冷却油进行了测试
  - What is the performance and pressure drop with other types of oil?
    它在其它种类冷却油下的压力损失和性能表现会如何?
- A fan works in different conditions than measured.
  一个风扇在不同于测试工况的条件下进行工作
  - Can I see a graph of the fan curve with different inlet conditions (temperature, pressure) in different units?
    我是否可以用一张图片显示在不同入口条件（温度、压力）下的风扇曲线并采用不同单位设置?

Components comparison
零部件对比

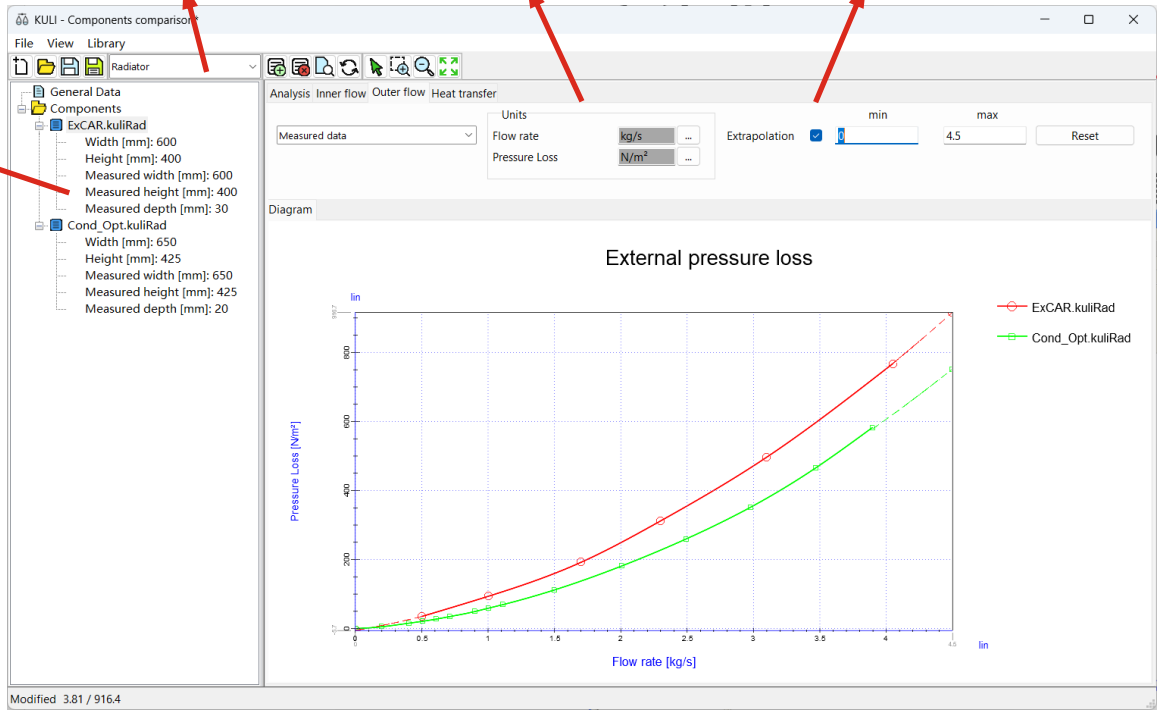
Component comparison 零部件对比

Component type for comparison
零部件类型

Units for comparison
单位设定

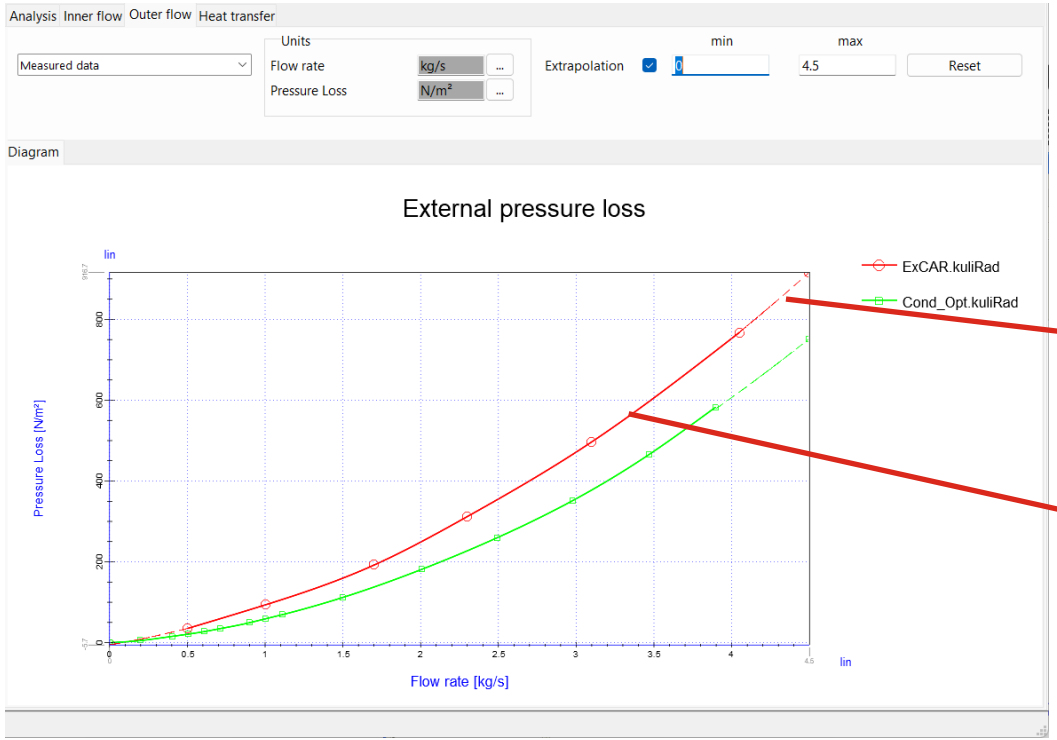
Data for extrapolation
数据外插值

Components for comparison
用于对比的零部件



Extrapolation 外插值

Radiator – Outer pressure loss
散热器 – 外侧压力损失

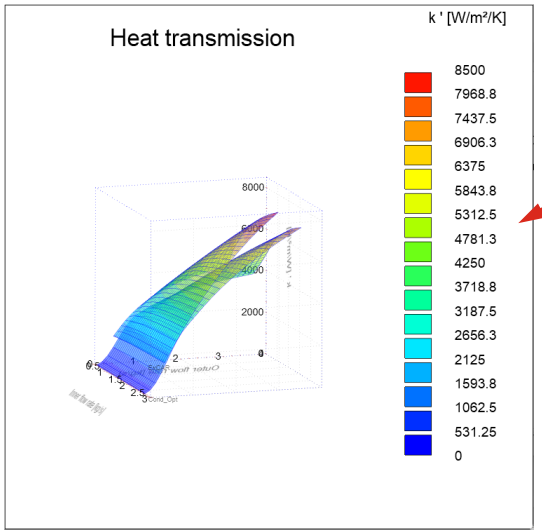


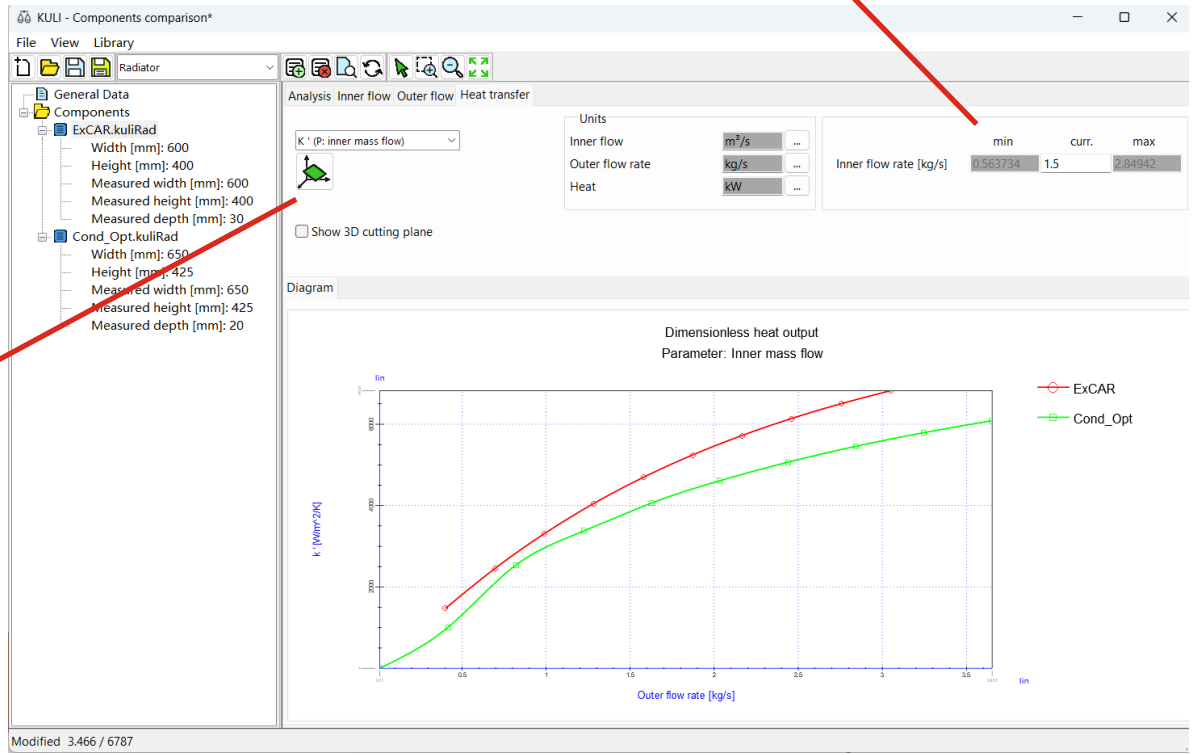
Extrapolation
外插值

Original line
原始数据线

Heat exchanger – heat comparison
换热器 – 换热量对比

Position of 3D cutting plane
三维切面位置

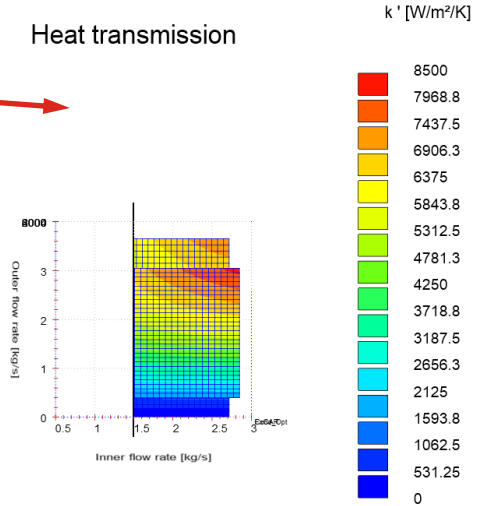




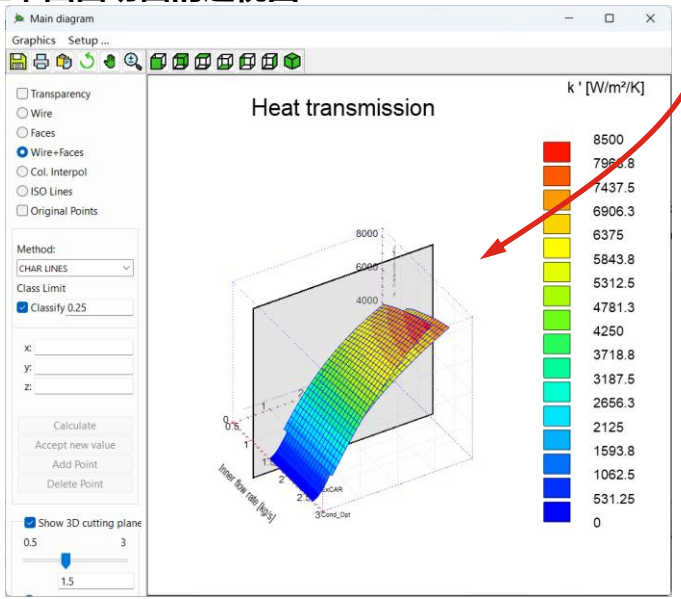
Heat comparison 换热量对比

Top view of 3D map with cutting plane
三维曲面切面的顶部视图

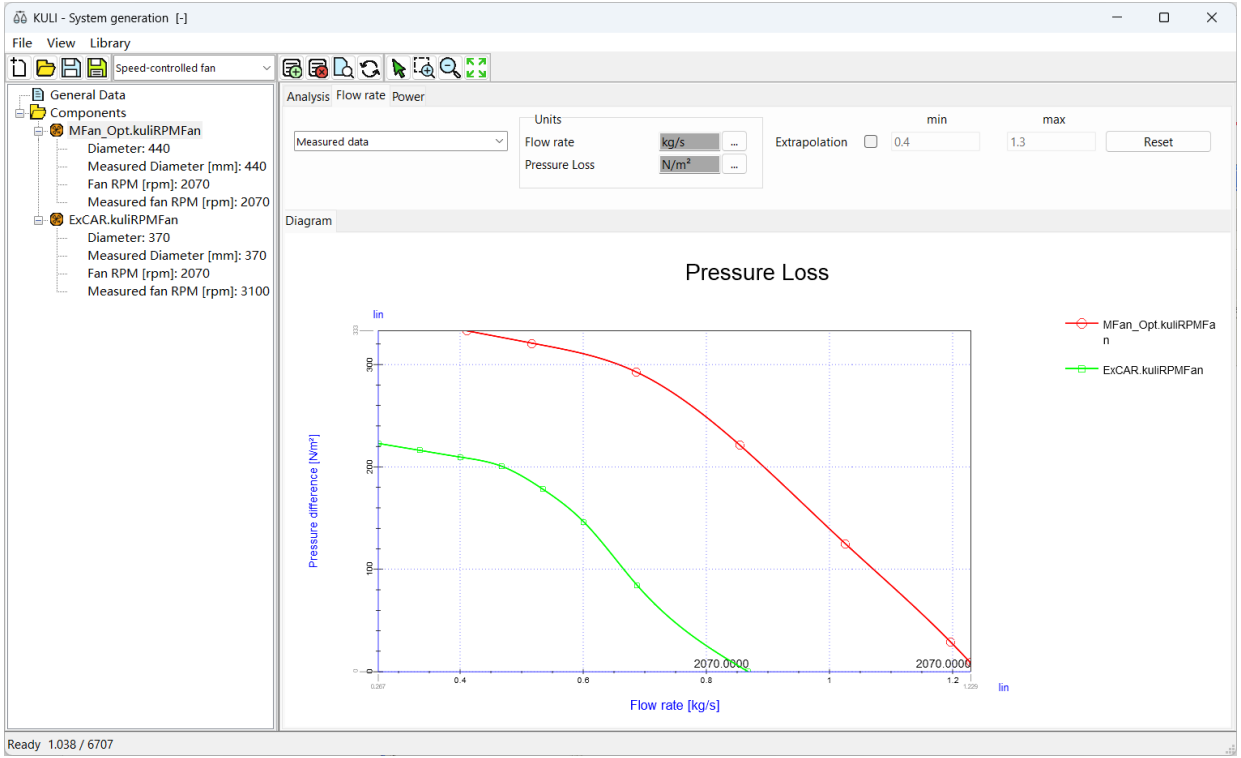
Cutting plane
切面



Perspective view of 3D map with cutting plane
三维曲面切面的透视图



Fan comparison 风扇对比



Components search
零部件搜索

Components search 零部件搜索

Search in KULI SCS-files or Component files

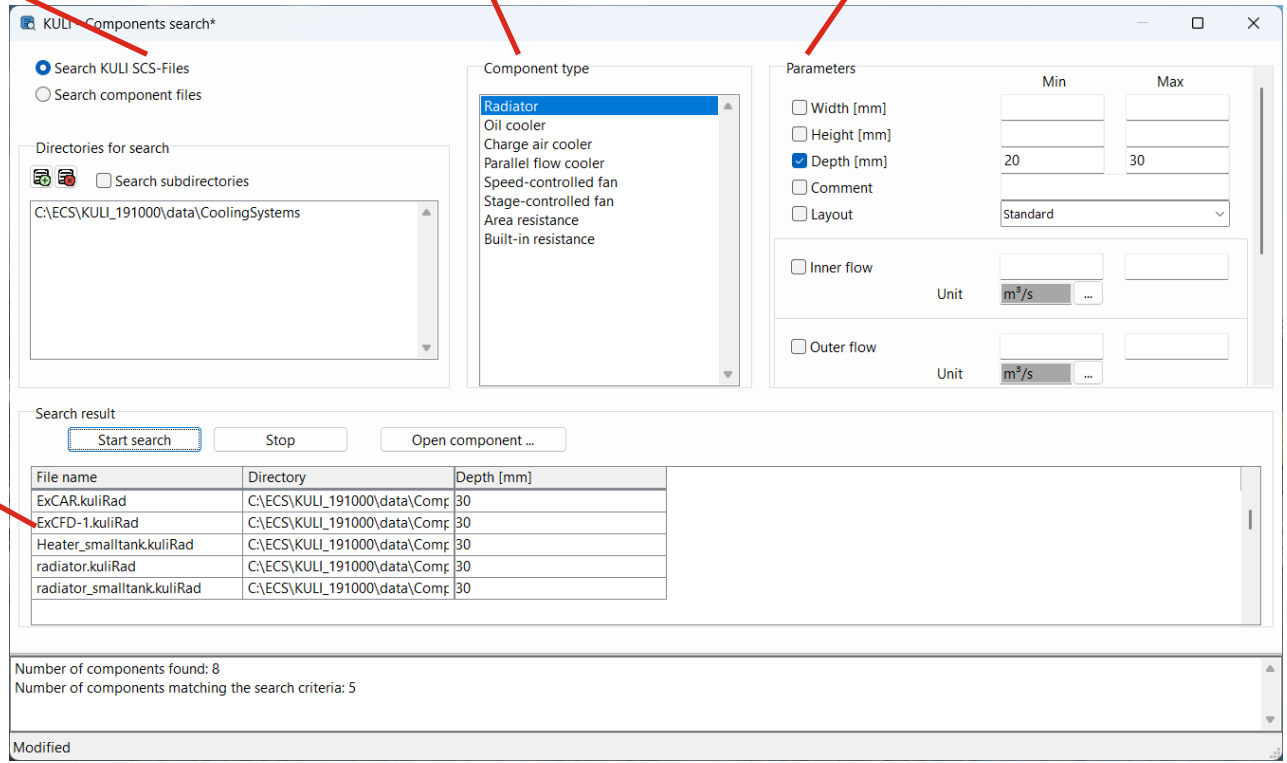
在KULI的scs文件或者零部件文件中进行搜索

Component type 零部件类型

Parameter 参数

Results in a table

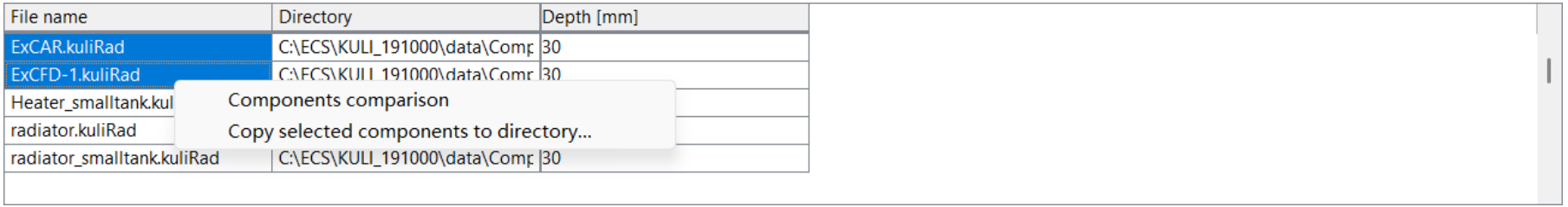
结果显示在表格中



Components search Step 2
零部件搜索步骤2

After sucessful search 在成功搜索后

- Start components comparison
  开始零部件对比
- Copy selected components to directory
  复制所选择的零部件至文件夹



Use context menu by right mouse click
使用鼠标右键点击菜单

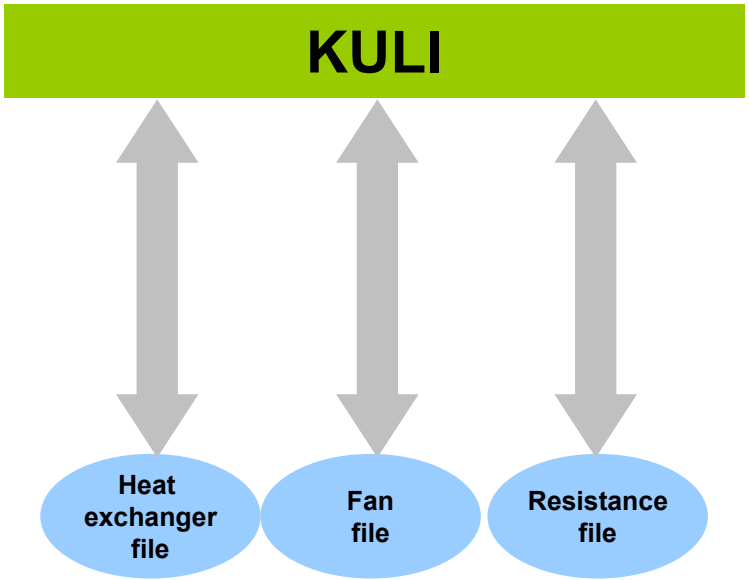
Data handling
数据处理

Data handling - extended input options
数据处理 – 扩展输入方式

Current situation 当前方式

KULI components can only be created with the software KULI

KULI零部件只能通过KULI软件进行建立



Problem 问题在于:

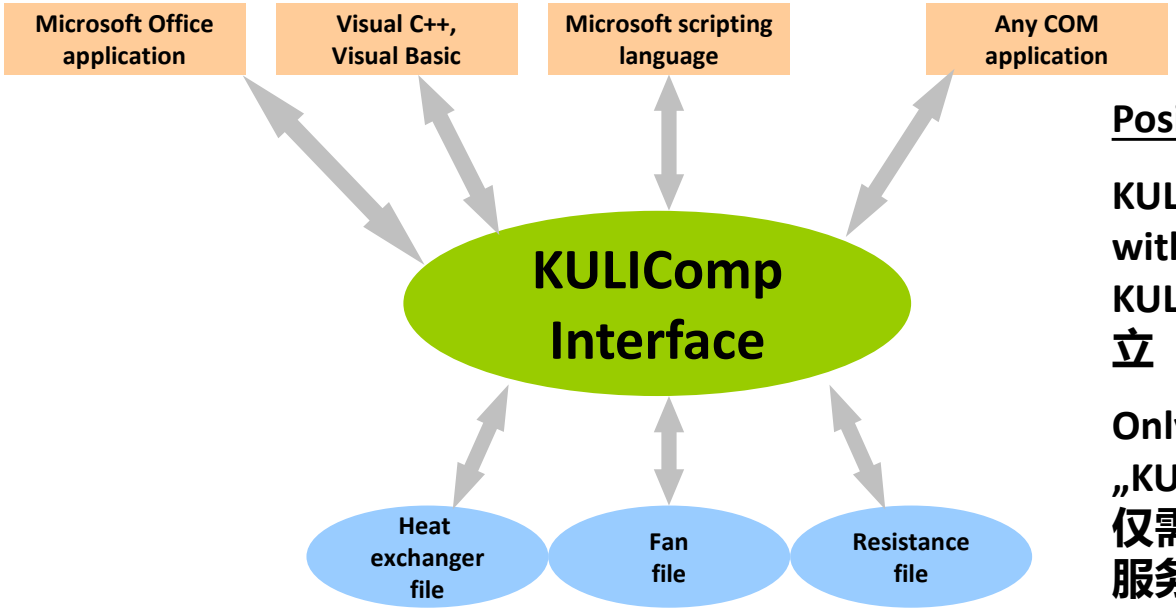
Everyone who wants to create a KULI component file needs the whole KULI software package.

所有想要建立KULI零部件的人都需要使用完整的KULI软件包

Data handling - extended input options
输出处理 – 扩展输入方式

Objective目的

Implementation of an interface to create KULI component files without KULI 使用接口工具在不使用KULI时建立零部件



Positive 优势:

KULI component files can be created without KULI.
KULI零部件文件可以不使用KULI软件建立

Only the COM server „KULICompInterface“ is required.
仅需使用”KULICompInterface“COM服务

Data handling – extended input options
数据处理 – 扩展输入方式

```
Sub Main()

Dim HeatX As KuliCompInterface.CHeatEx
Set HeatX = New KuliCompInterface.CHeatEx 'create heat exchanger object

'set type of heat exchanger, in this case a radiator
HeatX.TypeOfHeatX = hxtRadiator

'-----------------------------------------------------------
'general data
HeatX.GeneralData.User = "MyName" 'optional
HeatX.GeneralData.Date = "1-11-2004" 'optional
HeatX.GeneralData.Title = "Config1" 'optional
HeatX.GeneralData.Memo = ""

HeatX.GeneralData.Type = "Cross flow" 'optional
HeatX.GeneralData.Number = "No001" 'optional
HeatX.GeneralData.Manufacturer = "Company" 'optional
HeatX.GeneralData.Series = "S1" 'optional
HeatX.GeneralData.MeasDataFile = "file" 'optional

HeatX.Width = 600 'mm
HeatX.Height = 800 'mm
HeatX.Depth = 55 'mm

HeatX.Passes = 2 '1...standard, 2...u-flow, >2...s-flow

HeatX.NumberTubes = 132
HeatX.NoOfRowsOfTubes = 2
HeatX.TubeCrossSect = 34.21 'mm²
HeatX.WetPerimeter = 20.73 'mm

...
...
...

'-----------------------------------------------------------
'write KULI ratiator file
HeatX.WriteKuliFile "C:\temp\rad.kulirad"

End Sub
```

Connect to KULI COMPInterface and define type of component which should be created 连接KULI COMPInterface并定义零部件类型

Specify component data
定义零部件数据

Write component to file
写入文件

Data handling - extended input options
数据处理 – 扩展输入方式

Requirement 需求

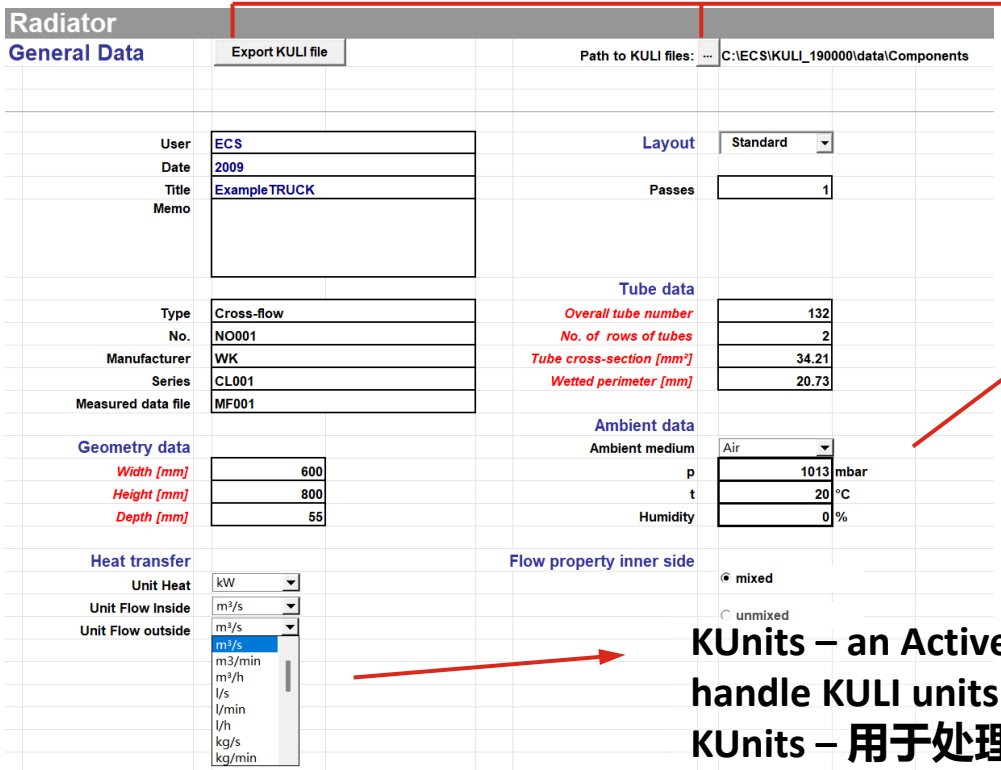
- Possibility to read and write KULI component files
  可以读取及写入KULI零部件文件
- Excel templates for data input of heat exchangers, fans and resistances
  用于换热器、风扇和阻力部件的Excel模板
- Visual C++ and Visual Basic examples for each component group will be created
  建立针对每种零部件的Visual C++ 以及 Visual Basic例子

Limitations 局限性

- No graphical representation like in KULI will be in the Excel templates
  Excel模板无法像KULI一样使用图形方式显示
- No plausibility checks of the data in Excel templates
  无法在Excel模板中进行数据合理性检查

Data handling - extended input options
数据处理 – 扩展输入方式

Excel Templates Excel模板



KULI components can be imported and stored
KULI零部件可以被导入和存储

KULI MediaX is used to handle media data
KULI MediaX用于处理媒介数据

KUnits – an ActiveX to handle KULI units is used
KUnits – 用于处理KULI单位的插件

Data handling - extended input options
数据处理 – 扩展输入方式

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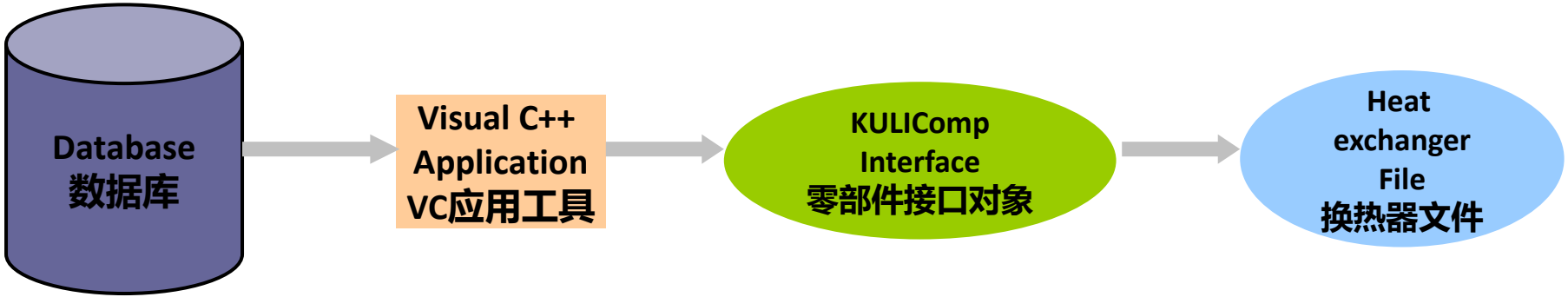
Example Customer: 客户案例

Generation of Radiator File (*.kulirad) from Database

从数据中建立散热器(*.kulirad)文件



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