ProREFD version 2021 – 1.2 (v.2021 – 1.2) update (30-Nov-2021)

PSE for SPEED Company Limited has developed new version of ProREFD from version v.2021 – 1.0 to version v.2021 – 1.2. the list of updated features is presented below.

1. ProREFD Database

In the latest version, additional data for GWP and ODP for R-compounds in ProREFD-Juhua database.accdb and ProREFD Database have been added. The statistics related to GWP and ODP data in Database v.2021-1.0 and v.2021-1.2 are compared in Table 1.1.

Table 1.1 The statistic of GWP and OPD of ProREFD version v.2021 – 1.2 compare with ProREFD version v.2021 – 1.0

	ProREFD version v.2021 – 1.0	ProREFD version v.2021 – 1.2 (Latest version)
GWP of R-compound	128	146
ODP of R-compound	42	230

2. ProREFD Main Interface

In the latest version of ProREFD (v.2021-1.2), a new option called Database Selection is added to the main interface, highlighted in Figure 2.1 and Figure 2.2, which are screen shots of the main interface of ProREFD v. 2021-1.0 and v.2021-1.2, respectively. The updated main interface of latest version is indicated by the red box in Figure 2.2. Before starting any work in ProREFD, in this version, users must select in which database they would like to work, before doing the database search, refrigerant selection and simulation. Start by clicking on Database Selection box, then, the interface will be presented as shown in Figure 2.3. In the database selection, there are 3 different databases as illustrated in in Figure 2.4, which are

1. ProREFD-Juhua database.accdb

> The ProREFD-Juhua database.accdb is includes only the R-compounds with their properties from ProREFD database. This database is set as a default.

2. User-Juhua.accdb

> The User-Juhua.accdb is includes all data given by Juhua. After selection, all the calculation in simulation and selection will be completed based on this database with from Juhua properties.

3. ProREFD Database

> The ProREFD Database is including R-compound and other small related compounds from PSE for SPEED database. After selection, all the calculation in simulation and selection will be completed based on database from Juhua properties

After finishing the database selection, user can further do the analysis as same as the methodology as indicated in previous manual or tutorial.
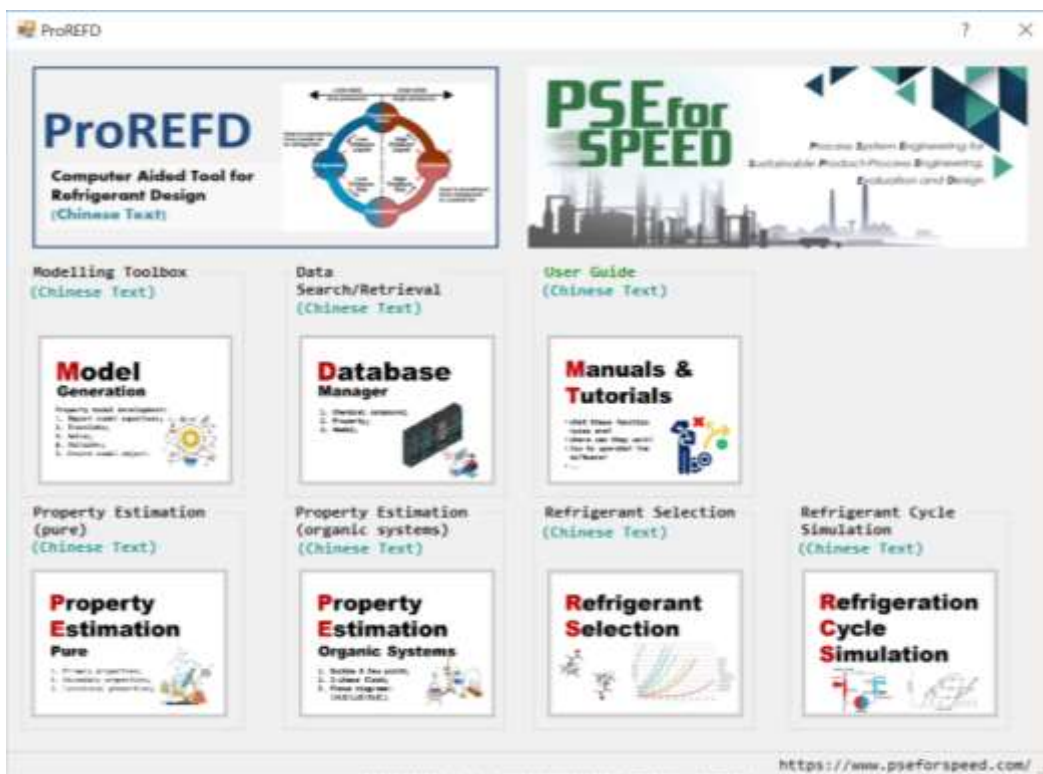
Figure 2.1 The main interface of ProREFD version v.2021 – 1.0
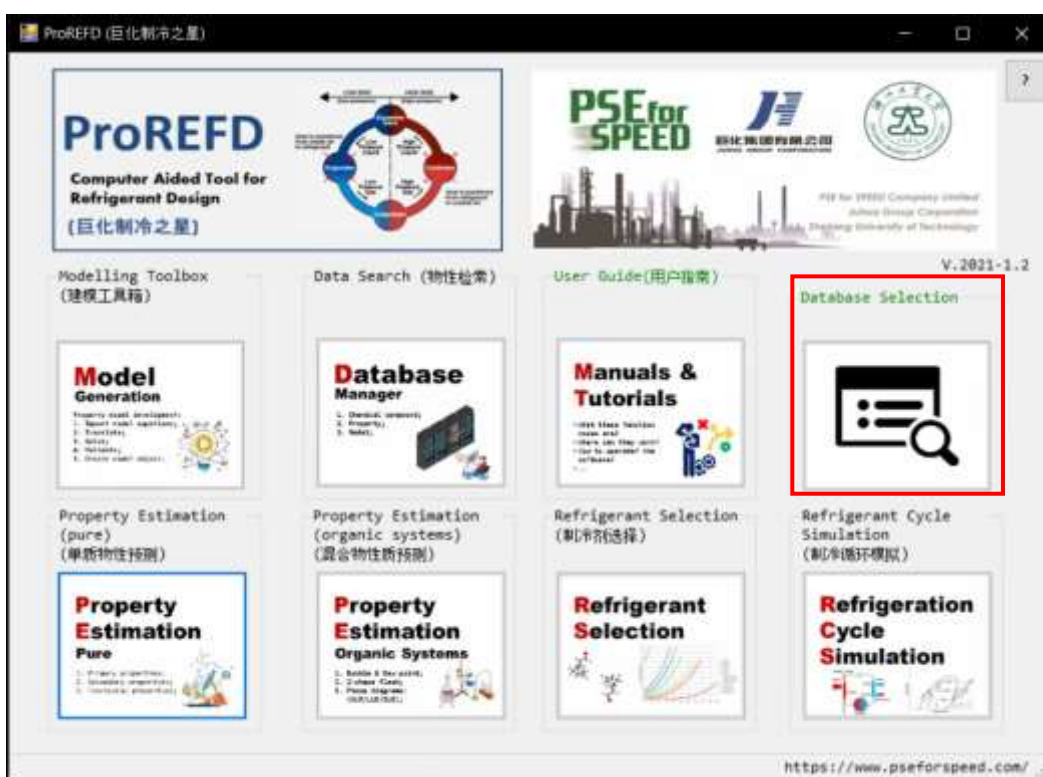

Figure 2.2 The main interface of ProREFD version v.2021 – 1.2

Figure 2.3 Database Selection interface

Figure 2.4 List of databases that can be selected

3. Refrigerant Cycle Simulation

For refrigerant cycle simulation feature, the operating system specification menu-page is updated. Referring to ProREFD v.2021-1.0, for condenser and evaporator, either pressure or temperature need to be given, as highlighted by the red box in Figure 3.1. However, in ProREFD version v.2021 – 1.2 temperature and pressure can be given or adjusted for both of condenser and evaporator. User is allowed to give the data from experiments if available, in order to obtain more accurate results, especially for mixture refrigerant (binary, ternary, quaternary, and quinary mixed refrigerant). The red box in Figure 3.2 shows the step of given the condenser pressure and evaporator pressure as the operating condition and temperature for both of unit will be automatically calculated. As shown in Figure 3.3, user is allowed to adjust the condenser and evaporator temperature to specific values. Note, however, addition of this data means over-riding the values calculated by ProREFD. Therefore, this result is not guaranteed by ProREFD.

After completion of operating condition specification, user can run simulation result as before.

Note that the figure of refrigerant cycle in the operating system specification tab is updated to make it more be clear, compared to the previous version, as highlighted in blue box in Figure 3.1 and Figure 3.2, respectively.
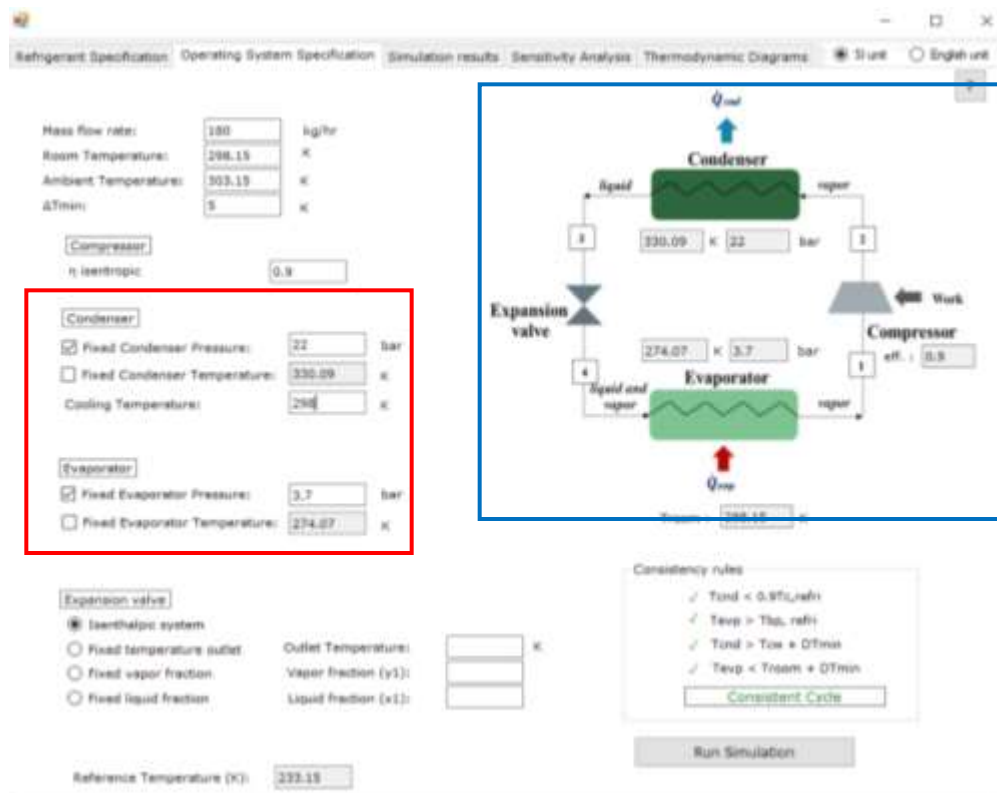
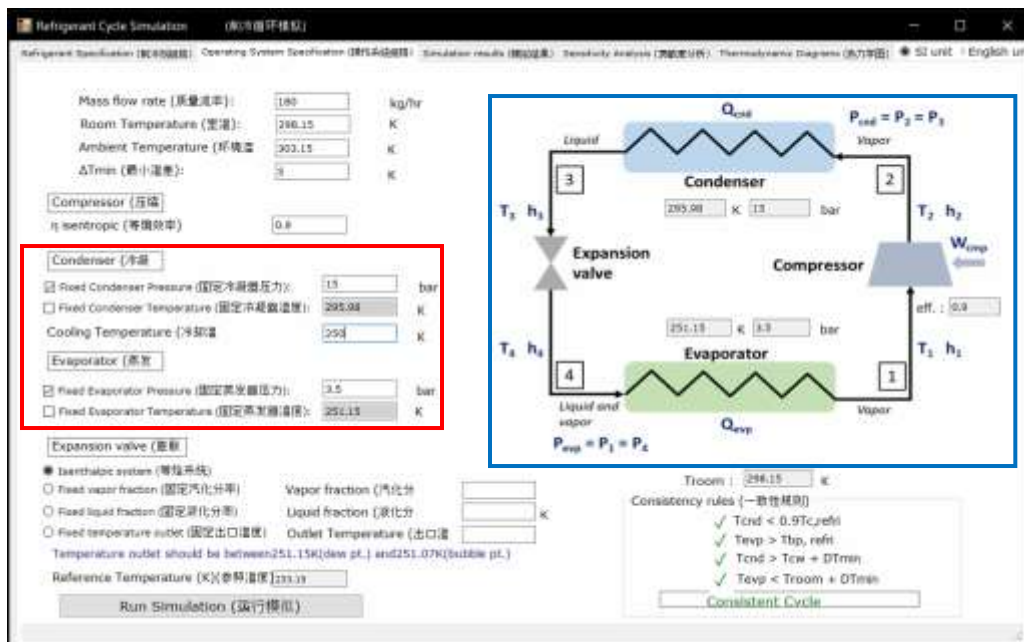**Figure 3.1** Operating condition tab in ProREFD version v.2021 – 1.0

Figure 3.2 Operating condition tab in ProREFD version v. 2021 – 1.2 before adjusting the condenser and evaporator temperature in case
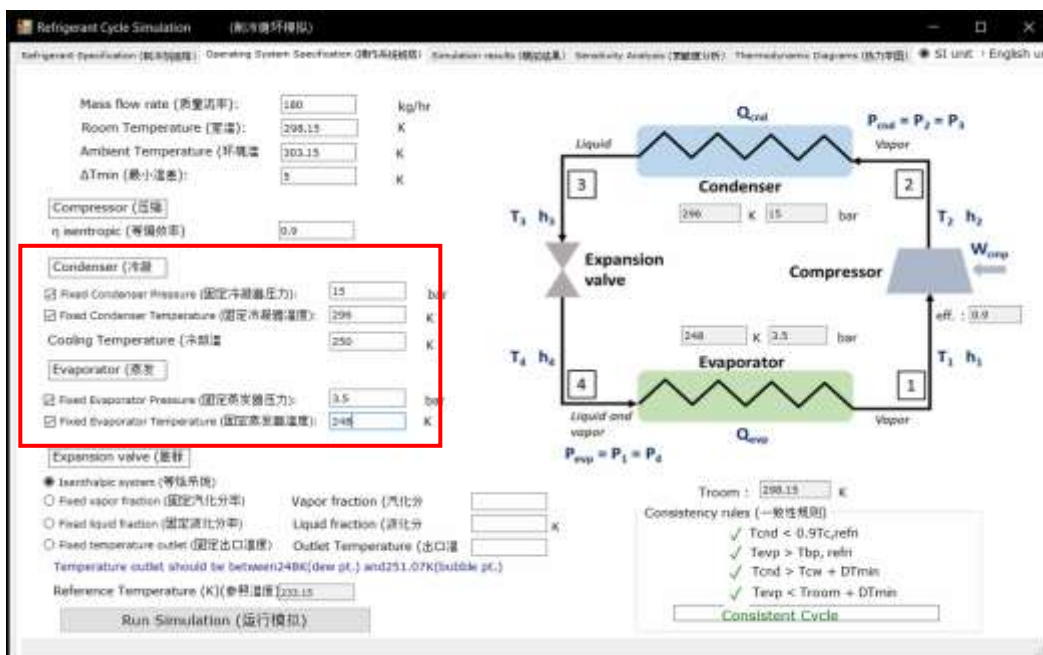
Figure 3.3 Operating condition tab in ProREFD version v.2021 – 1.2 after adjusting the condenser and evaporator temperature in case