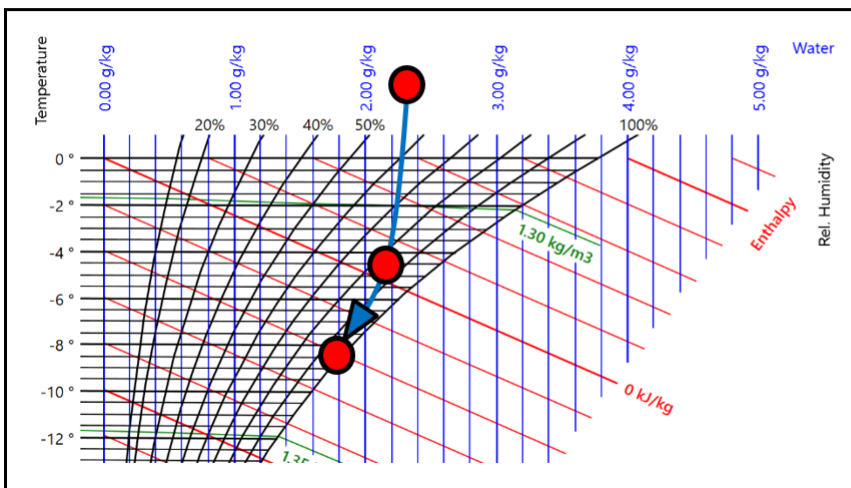# Upgrade on 2022
What has changed?

The number of refrigerants has been increased by 5 from 31 to 36, all 5 of which are blends with the appropriate glide (**R452B, R454B, R454C, R455A, R515B**). REFPROP from NIST was used as a basis, which mentions that the thermodynamic properties of the refrigerant **R515B** are only estimates. The refrigerant **R455A** has the highest glide of **12.85 K** at 1.00 bar.

Based on numerous measurements at TUEV Süd in Munich, the performance of the finned heat exchangers was **reduced marginally** in all applications. It has been found that due to the manufacturing process there is a **thin film of oil on the fins**, which explains the reduced performance, when it is completely removed. However, if you're confident that your finned heat exchangers will still perform as well as they did once you've completely removed the oil film, you can easily **correct this with the VDI ratio**. However, if this thin film of oil hardens over time to form a compact coating, its thermal conductivity drops, which can result in a 10% reduction in performance.

If the surface temperature and the outlet temperature are below 0°C when cooling the humid air, frost does not necessarily have to form, if the relative outlet humidity is less than 100%. You can **control the frost output with the factor in cell K2**. The smaller this factor is, the more frost capacity is reported. Based on measurements, we recommend using a factor of 0.90. This factor is located on the first Excel page «**Software**».

WAHR	0.90	Factor: Frost capacity (0.00 to 1.00)

The airside reported **pressure drop depends on the degree of icing** and is controlled by the defrost interval in hours. If you change this interval, one of the two following macros must be executed. The same applies to changes in the heat exchanger parameters such as fin pitch, number of tube rows, etc.

Check the fin coil size with dual fin spacing			Check the fin coil size with triple fin spacing		
Tube rows on the depth		Fin spacing	Tube rows on the depth		Fin spacing
Range	Piece	mm	Range	Piece	mm
1	2	6.000	1	2	12.000
2	6	3.000	2	2	6.000
total	8	3.429	3	4	3.000
			total	8	4.364

Equal fin spacing
If all fins have the same spacing, enter the same value in cells **L66** and **L67** and use the macro "**Check the fin coil size with dual fin spacing**".

What we've to do after value changes ?!?
It is essential to execute one of the two macros on the left "Check the fin coil size ....".