



## THE IMPORTANCE OF USING THE CORRECT GWP VALUE

As the dust settles on the new F-Gas Regulation 517/2014, which comes into effect on January 1st 2015, knowing the correct GWP value of the refrigerant used in a system as defined by the new regulation, takes on even greater importance. Peter Dinnage of Climalife reports.

**GWP stands for Global Warming Potential. It is a numerical value calculated as the potential of a refrigerant, if released to atmosphere, to affect global warming relative to the effect of the same quantity of Carbon dioxide (CO<sub>2</sub>) over a given time period.**

The values are calculated by the Intergovernmental Panel for Climate Control (IPCC) and take into account a number of factors. Unfortunately as atmospheric science has evolved, these numbers have been refined over time. Some have gone up whilst others have come down. The first F-Gas regulation 842/2006 used values from the 3rd IPCC Technical assessment report which was published in 2000. This was followed in 2007 by the 4th IPCC Assessment and it is these values that are used for the new F-Gas regulation 517/2014. Many suppliers have been quoting these values for over 5 years, however, it is easy to become confused because other values may be referred to, depending on the origin and date of the document.

**Knowing the correct GWP value of a refrigerant as defined in the F-Gas legislation is important as they are the basis for some bans and for changes to the leak checking requirements.**

The legal document lists a range of single component fluorinated products in Annex 1 & 2 and Annex 4 explains how the GWP of refrigerant blends are calculated based on the components of that blend.

In 2020 it will be illegal to use refrigerants with a GWP > 2500 in new equipment, except those operating below -50°C. Servicing and maintenance of systems with virgin refrigerant if the GWP is >2500 will also be prohibited from 2020 for system that have a charge greater than 40T CO<sub>2</sub> Equivalent. For R404A this is 10.2kg. The use of reclaimed refrigerant will, however, be allowed until 2030.

REFRIGERANT	134a	407C	407F	410A	407A	438A	417A	424A
GWP	1430	1774	1825	2088	2107	2265	2346	2440
REFRIGERANT	422D	422A	434A	428A	404A	507	508B	23
GWP	2729	3143	3245	3607	3922	3985	13396	14800

Table 1

A GWP value limit of 750 will also affect new split AC systems with a charge below 3kg, but not until 2025. At such time, the use of R410A will be prohibited in this size of new system.

Equipment manufacturers will also need to reference the correct GWP values for labelling, documentation and advertising.

**One of the most important changes that will impact on some end-users from 1st January 2015 relates to change in the frequency of leak check requirements.**

OLD LEGISLATION	NEW LEGISLATION	LEAK CHECK FREQUENCY
3-30kg	5-50T CO <sub>2</sub> Equivalent	Every 12 Months, but does not apply to hermetically sealed systems, if below 10TCO <sub>2</sub> Eq
30-300kg	50-500TCO <sub>2</sub> Eq	Every 6 months, extended to 12 months with fixed leak detection system
300kg or more	500 TCO <sub>2</sub> Eq	Automatic leak detection required, check every 6 months

Table 2 Leak Checking Frequency.

This value is different for each refrigerant and means that for R134a and any refrigerant with a GWP value below 1667 the thresholds increase slightly, but for higher GWP refrigerants such as R404A they are reduced significantly. As of 1st January 2015, fixed automatic leak detection will be required on R404A systems with a charge of 127kg or more. One of the aims of the regulation to reduce emissions is therefore met by encouraging more frequent leak checks for higher GWP refrigerants. The leak check requirements for R407C in water chillers are unlikely to be affected dramatically, whilst there is very little R410A equipment with a charge over 240kg.

For systems with a charge of less than 3kg (6kg for hermetic systems) the changes to the leak checking regime will not apply until 2017.

The new leak checking requirements for each of the common refrigerants are detailed in Table 3:

		Refrigerant Charge - Kg		
Refrigerant	GWP	5 T CO <sub>2</sub> Eq.	50 T CO <sub>2</sub> Eq.	500 T CO <sub>2</sub> Eq.
134a	1430	3.5	35.0	350
407C	1774	2.8	28.2	282
407F	1825	2.7	27.4	274
410A	2088	2.4	23.9	239
407A	2107	2.4	23.7	237
438A	2265	2.2	22.1	221
417A	2346	2.1	21.3	213
424A	2440	2.0	20.5	205
422D	2729	1.8	18.3	183
422A	3143	1.6	15.9	159
434A	3245	1.5	15.4	154
428A	3607	1.4	13.9	139
404A	3922	1.3	12.7	127
507	3985	1.3	12.5	125
508B	13396	0.4	3.7	37
23	14800	0.3	3.4	34

Table 3 Refrigerant charge thresholds for 5, 50 and 500 CO<sub>2</sub> Equivalent Tonnes

We strongly recommend that everyone reviews their leak checking requirements under the new regulation, as it will still require records to be kept to show the correct frequency is adhered to and, where necessary, fixed leak detection is fitted.

Amid all the confusion, ensuring the correct GWP value is known for each refrigerant used is now more important than ever. This will not be helped as the IPCC 5th Technical Assessment is on its way and some refrigerants will have different values, but as far the new F-Gas regulation is concerned the GWP values are set for the foreseeable future.