

TURBO-K

Technical Bulletin No. 3

The Use of Antifreeze with Turbo-K Industry Standard 1:4 Concentrate

Aqueous solutions of Turbo-K are stable at temperatures well below freezing point. However, in use, the rapid evaporation of water, especially when on-line cleaning, can induce freezing and ice formation on the leading edges of the blades in the initial stages of the compressor. Whenever engine cleaning is carried out at temperatures near or below the freezing point of water (0°C/32°F) there is a risk of some ice formation and therefore blade damage. Experience suggests use of some form of antifreeze to prevent icing of the compressor blades whenever the ambient air temperature falls below +10°C (50°F). **Turbo-K Gas Turbine Cleaner** can be blended with all the normal antifreezes and used in temperatures down to as low as -40°C (-40°F). In some cases where the temperature is between -40°C (-40°F) and -52°C (-62°F), Ethylene Glycol based antifreeze could be used as long as this product is approved by the gas turbine manufacturers.

Turbo-K Gas Turbine Cleaner is normally supplied to users as “**Turbo-K 1:4 Concentrate**”, which is a clear straw-amber colour, mobile liquid. Operators dilute this with potable or demineralised water in the ratio of **1 part Turbo-K 1:4 Concentrate to 4 parts water** to produce a working solution, for off-line or on-line cleaning respectively.

Our recommended antifreeze is Mono Propylene Glycol which gives the maximum protection to the compressor and at the same time is ecologically friendly. This product is non-hazardous and biodegradable with no health and safety issues.

Although Methanol and Iso-Propyl Alcohol are toxic and flammable, they are compatible with Turbo-K and may be used as antifreeze.

Mono Ethylene Glycol antifreeze may also be used with Turbo-K. This product may, however, leave sticky deposits on the blades and therefore, it is recommended that the manufacturers’ on-line and off-line cleaning manuals are consulted prior to use.

Recommended Additions of Demineralized Water and Antifreeze to **Turbo-K 1:4 Concentrate** to make 100 Ltrs working solution:

Ambient Air Temperature	Turbo-K 1:4 Concentrate (Litres)	Water / Mono Propylene Glycol (Litres)	Water / Iso-Propyl Alcohol (Litres)	Water / Methanol (Litres)	Water / Mono Ethylene Glycol (Litres)
Above 5°C or 41°F	20	80 / 0	80 / 0	80 / 0	80 / 0
+5° to -5°C or +41° to +23°F	20	60 / 20	60 / 20	60 / 20	55 / 15
-5° to -20°C or +23° to -4°F	20	40 / 40	30 / 50	50 / 30	40 / 40
-20° to -30°C or -4° to -22°F	20	30 / 50	10 / 70	40 / 40	35 / 45
-30° to -40°C or -22° to -40°F	20	20 / 60	Not Suitable	30 / 50	25 / 55
-40° to -52°C or -40° to -62°F	20	Not Suitable	Not Suitable	Not Suitable	20 / 60

Adding antifreeze to pre-diluted Turbo-K RTU (Ready-To-Use) is not recommended since this may affect the product performance.

However, if pre-diluted Turbo-K RTU must be used at temperatures near or below the freezing point of water (0°C/32°F) temporarily, then additions of Antifreeze (in Litres) to each 100 Litres of Turbo-K RTU should be based on the following guideline.

Ambient Air Temperature	Turbo-K RTU (Litres)	Mono Propylene Glycol (Litres)	Iso-Propyl Alcohol (Litres)	Methanol (Litres)	Mono Ethylene Glycol (Litres)
Above 5°C or 41°F	100	Nil	Nil	Nil	Nil
+5° to -5°C or +41° to +23°F	100	25	25	25	18
-5° to -20°C or +23° to -4°F	100	70	100	43	70
-20° to -30°C or -4° to -22°F	100	100	Not Suitable	67	85
-30° to -40°C or -22° to -40°F	100	150	Not Suitable	100	120
-40° to -52°C or -40° to -62°F	100	Not Suitable	Not Suitable	Not Suitable	150

Tech Bulletin No 3 (Revision 4) 19/02/15

Turbo-K International Ltd
13a Brindley Close, Holly Lane Ind. Est.
Atherstone, Warwickshire CV9 2QZ UK
Tel: +44 (0)1827 722911
www.turbo-k.biz