Gas Properties - Carbon Dioxide

Gas Name	Chemical Formula	Chemical Family
Carbon Dioxide	CO_2	Acid Anhydride
Synonym(s)	Carbon Anhydride, Carbonic Acid, Dry Ice	

Molecular Weight	Critical Pressure (psia)	Critical Temperature (R)	Ratio of Specific Heats
44.010	1073	548	1.300

Physical Characteristics	Solubility
Colorless, Odorless	Soluble in water, alcohol and alkalis

Applications or Uses

Urea Plants, Carbonation, Chilling and Freezing, Fire Protection, Chemical and Synthesis Processes, Re-Injection.

Hazards

Asphyxiant. When mixed with water, produces Carbonic Acid.

Material Requirements

Dependent on operating conditions is be corrosive. Please review the guidelines of the Ariel Applications Manual.

Lubrication

Standard guidelines for lube or non-lube service. CO_2 may combine with water to produce Carbonic Acid. This acts as a solvent and tends to dilute cylinder lubricating oil. CO_2 is soluble in mineral oils, which reduces oil/gas mix viscosity. In addition, mineral oils are completely miscible into CO_2, thereby reducing the quantity of lubricant at the lube site. Compounding or PAG synthetics are commonly used. Follow guidelines of Ariel Packager Standards.

Comments (see also Carbon Dioxide Service topic)

When used in Re-injection or Urea plants, the gas is compressed to higher pressures and may reach critical point or dense phase region at interstage pressures. Due to the critical temperature (88 degrees F) and pressure of 1073 psia, it is imperative to monitor interstage pressures and temperatures. If interstage pressures are near critical or above, it may be necessary to control temperatures out of the intercooler to ensure there is a margin above critical temperature or dense regions.