High Level Clouds

	Description, Formation and Composition	Weather and Icing Hazard
Cirrus (CI)		
	• Detached clouds in the form of delicate white filaments or white patches or narrow bands. These clouds have a fibrous or hair like appearance, or a silky sheen or both. • Forms with widespread ascent often associated with frontal lifting or convergence in a low pressure system. Also forms on top of large cumulonimbus. • Composed of ice crystals.	• If wispy, no significant icing or turbulence. • If dense or in bands turbulence is likely. • Nil icing risk.
Cirrocumulus (CC)		
	• Thin sheet or layer cloud that contains many very small elements in the form of grains or ripples more or less regularly arranged. • Forms with widespread ascent often associated with frontal lifting or convergence. Often associated with turbulence between two horizontal airflows in the upper atmosphere. • Composed of ice crystals or a mixture if ice crystals and liquid water droplets.	• Occasionally light to moderate turbulence associated. • Too high for significant icing.
Cirrostratus (CS)		
	• Thin sheet of transparent cloud often covering the entire sky and giving it a milky appearance. When thick enough can produce the halo phenomena. • Forms with widespread ascent often associated with frontal lifting or convergence. Sometimes the result of the lifting of thin altostratus or the smoothing of the elements of cirrocumulus. • Composed of ice crystals.	• Occasionally light to moderate turbulence associated. • Usually too high for significant icing.

Mid Level Clouds

	Description, Formation and Composition	Weather and Icing Hazard
Altocumulus (AC)		
	• White of grey layer or merging layers of cloud. Regularly arranged clumps or rolls are visible.	• Little associated weather • Occasionally some light rain or snow may fall from the base but evaporates before reaching the ground. (Virga) • Possibility of light rime ice.
Altostratus (AS)		
	• Grey or bluish layer of cloud. Often totally covering the sky. Parts are thin enough to reveal the sun vaguely. No halo phenomena	• When thick it can produce intermittent or continuous rain or snow. Virga is also common. • Definite risk of icing. • Moderate rime ice. • Clear ice possible in the lower levels of the cloud.

Low Level Clouds

	Description, Formation and Composition	Weather and Icing Hazard
Nimbostratus (NS)		
	• Grey, often dark cloud layer. Base is often indistinct due to precipitation. Low ragged clouds (fractostratus) often occur beneath the base. • Sometimes extends into the middle levels. • Forms with widespread ascent due to convergence, especially in monsoonal troughs and slow moving fronts. • Composed of water droplets with a mixture of ice crystals and liquid water droplets near the top.	• Moderate to heavy rain or snow. • Definite risk of icing. • Moderate rime ice • Clear ice probable in the lower layers of the cloud, especially when turbulence is present.
Stratocumulus (SC)		
	• Grey or whitish layer containing darker elements as a chequered pattern or rolls. • Forms with turbulence in the surface layers, or cumulus spreading out beneath an inversion. • Composed of water droplets.	• Usually little associated weather but light rain or drizzle is common.
Stratus (ST)		
	• Generally a grey cloud layer with a uniform base. Sometimes in the form of ragged patches. • Forms with orographic or frontal lifting of stable air. Lifting of fog after sunrise. • Composed of water droplets.	• Drizzle is typical. • Usually no icing risk.

Low Level Clouds

	Description, Formation and Composition	Weather and Icing Hazard
Cumulus (CU)		
	• Detached clouds with sharp outlines. Usually in the form of rising mounds or towers of which the tops resemble cauliflower. The base looks darker and is nearly flat. • Convection, or other lifting in conditionally stable layers of the atmosphere. • Composed of water droplets, supercooled water droplets and ice crystals near the tops of large cells.	• Nil weather in small cummulus, otherwise showers of rain or snow, sometimes virga if the base is high. • Little risk of icing. Freezing level is usually above this cloud.
Cumulonimbus (CB)		
	• Heavy dense cumuloform cloud of great vertical extent. Part of its upper portions spreads out into a smooth anvil of cirrus cloud. Very dark beneath the base with ragged patches (fractoscumulus). Often rolling or swirling motions can be seen in the lower layers. • Developes from normal cumulus due to any lifting mechanism when a considerable depth of the atmosphere is conditionally stable. • Composed of water droplets, supercooled water droplets, snowflakes and hail. Ice crystals near the top.	• Heavy showers of rain, hail or snow. Lightning, squalls at the surface and occasionally tornados or water spouts. • Severe to extreme turbulence. • Definite risk of icing. Dangerous clear ice likely.
		

Cumulonimbus as seen from above

Other Clouds of Interest to Aviators

	Description, Formation and Composition	Weather and Icing Hazard
Mammatus		
	• Mammatus may appear as smooth, ragged or lumpy lobes and may be opaque or semi-transparent. • The mechanism of formation of mammatus clouds is not well understood. Most theories related to the overturning of the air mass that is descending from the anvil of cumulonimbus. • They usually are composed of ice, but also can be a mixture of ice and liquid water or be composed of almost entirely liquid water.	• These clouds only form around the strongest of storms and in a highly sheared environment. Aviators are advised to stay well clear.
Lenticular		
	• Lenticular clouds are stationary clouds that form at high altitude. They are normally aligned perpendicular to the wind direction. • Where stable moist air flows over a mountain or a range of mountains, a series of large-scale standing waves may form on the downwind side. If the temperature at the crest of the wave drops to or below the dewpoint, moisture in the air may condense to form lenticular clouds. • Glider pilots actively seek out these clouds because of the strong mountain wave activity associated with there formation.	• Strong turbulence associated with rotor action.