

FOG- Steve Warmath, Safety Officer



I think everyone has experienced fog. Although there are different types of fog, essentially fog is a cloud on the ground which reduces visibility to less than 1/3 of a mile. The basic requirements for fog to form are moisture in the air – the closer to 100% humidity the better, and the air near the ground must be cooling to within 5 F of dew point – this is the temperature to which air must be cooled in order for water vapor in the air to condense to liquid water. When the air near the ground cools to dew point, the water vapor in the air will become visible as fog in the air or dew on the ground.

Fogs during summer will only happen with clear skies and near 100% humidity. There must also be condensation nuclei – or something onto which the water can condense. Condensation nuclei can be dust particles, aerosols, pollutants etc. When the air is saturated, additional moisture will condense onto this nuclei. Fog so often forms after sunset because that is when the air begins to cool and condensation replaces evaporation. Air cools best with clear skies as there are no clouds to trap the heat. Fog can form at lower humidity levels if there are a really large amount of nuclei, especially if it is something such as salt.

During the summer, if there is a storm which includes hail, a phenomenon called hail fog can form. It is usually a shallow layer of fog above the ground. It forms because of increased moisture and cold air coming in contact with the warm ground.

During fall and early winter the most common form of fog is radiation fog. This type of fog forms when the land cools after sunset by radiating the heat up into the atmosphere. The air must be calm and the skies clear, again because cloud cover will trap heat in. When the ground is cool, it will cause condensation in the air above it. The more calm the air, the lower the fog is, under ideal conditions, the fog may only be 3 feet deep. Air movement will produce a thicker fog. Radiation fog can occur throughout the night but rarely lasts long after sunrise.



During winter – fog forms in a different manner, almost the opposite of summer fogs. During the winter months, fog will form when humid air moves over a cold surface. Winter fog is more common around bodies of water and is sometimes called lake effect fog.

In high northern or southern latitudes, especially around urban areas Ice fog can form. Ice fog is any type of fog where the droplets freeze into very tiny crystals in midair. This type of fog forms when the air temperature is well below freezing, generally below zero, so that any vapor present almost immediately condenses. Vapor is added to the air by automobile exhaust, furnaces and industrial plant exhaust. Ice fog can be extremely dense, posing driving hazards and the fog can last all through the day and night. The minuscule ice crystals sparkle in the sunlight and are often called “diamond dust”. Diamond dust can pose a health hazard if too much is inhaled. The Shoshone tribe of Native Americans had their own name for ice fog: they called it the Pogonip, which means “white death.” again because of the hazards of breathing it in.

If you live near the ocean you will likely have seen sea fog. Sea fog forms when the condensation nuclei is salt. Salt is, of course, very common near the ocean where it is kicked up into the atmosphere by the breaking waves. Salt is a unique condensation nuclei in that it will allow fog to form when the humidity is as low as 70%. Typically this fog begins as a transparent mistiness which rapidly changes to thick fog. Sea fog is a common type of fog along the California coast.



Fog can sometimes be accompanied by drizzle when the humidity stays at 100%. When this happens tiny cloud droplets can coalesce into larger droplets. When the temperatures are below freezing the drizzle will freeze producing very hazardous driving conditions. Drizzle usually occurs just as the fog is lifting, and therefore cooling, or when the droplets are being compressed from the droplets above.

When wind blows moist air over a cool surface the air will cool and advection fog will form. Advection fog is very common at sea when tropical winds pass over cooler waters and on land when a warm front passes over heavy snow. It can also form in areas of upwelling, such as along the California coast. During spring or fall a cold front can propel the air layer over the land. During the summer months, a low pressure trough can be produced by intense heating inland which creates a strong pressure gradient, pulling the fog in from the water. Also during the summer, during the monsoons, a high pressure over the desert can create a southerly flow which pushes the offshore layer of air up the coastline. This type is most commonly created after a heat spell.

Many people find fog beautiful, but no one can deny it is a visibility hazard. Before radar, fog caused many a collision. Cars, trucks and motorcycles however, don't have radar and must use extra caution driving through fog. Localized fog is especially dangerous to unwary drivers when it appears suddenly.

For those of you that have high performance lighting upgrades and appear like a fireball coming down the road, fog can severely reduce visibility due to reflection. The risk of overdriving your visibility, particularly at night, can bring that big machine down to a crawl. You have heard not to drive your car with high beams on in the fog? It's the same thing for motorcycles. Slow down or if the conditions are bad enough, get off the road.

Be careful out there....it's a jungle. *Steve*