

Jet Fuel is a Clear to Straw-Colour Fuel

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Perspective

Jet fuel is in an exceedingly low one amongst one in every of the foremost fossil oil product made from process crude in an oil refinery. Jet fuel is one in every of the higher-valued lightweight product (along with hydrocarbon and diesel). It's used primarily within the transportation sector. It's the first fuel employed in jet craft, however it's additionally employed in different jet rotary engine applications [1].

The same material wont to build jet fuel is additionally oversubscribed because the product coal oil for non-aircraft uses, however with lower quality specifications. The coal oil wont to build jet fuel encompasses a boiling point between hydrocarbon and diesel varies material. Consequently, jet fuel will be a swing fuel, stealing volume from hydrocarbon and diesel once jet fuel costs square measure high, and contributively volume once jet fuel costs square measure low.

Jet fuel is one in all the foremost important needs of flight operations. Sadly, some flight operators and specialists don't recognize the various forms of jet fuels, et al. confuse fuel specifications. This guide can cross-check the various forms of jet fuel, their specifications, and their use in numerous craft [2].

Types of Aviation Fuel

Like vehicles, craft will use varied fuels, however 2 are the foremost common – Jet Fuel and AVGAS. Generally, non-public jets, industrial airplanes, and aviation craft wide use and rely upon Jet Fuel and AVGAS to operate expeditiously. However, the correct aviation fuel depends on AN aircraft's engine sort.

Jet Fuel

This is a refined kerosene-based, colourless style of fuel that's utilized in craft with rotary engine engines, together with turboprops and jet engines. There are 2 main forms of jet fuel – Jet A and Jet A1. though flight operators will use each fuels interchangeably for flight operations, there are some variations in producing specifications.

For instance, Jet A1 contains a lower temperature (-47O°C) than Jet A (-40O°C), creating it appropriate for long-haul international flights, significantly those overflying polar routes. Similarly, in contrast to Jet A, Jet A1 has static dissipater additives, that decrease any static charges which will kind throughout the movement of the fuel.

Jet A1 is that the most typical style of jet fuel within the us, and it is accustomed power all jet craft. Jet A1 and Jet A are easier to get than AVGAS as a result of, throughout the purification method, jet fuel comes off initial. Its straightforward purification method conjointly makes Jet Fuel less expensive than AVGAS [3].

AVGAS

Also referred to as aviation gas, AVGAS is employed to power ancient propeller craft and little piston-engine airplanes. This includes craft operated by non-public pilots, flight coaching jets, and flying clubs. AVGAS contains tiny amounts of lead tetraethyl, a substance that stops hurt to the engine detonation or knocks.

Unfortunately, lead tetraethyl is cyanogen to humans once indrawn

or absorbed into the blood. Luckily, efforts are afoot to eliminate it from AVGAS.

There are 2 main forms of AVGAS, AVGAS one hundred and AVGAS 100. the main distinction between the 2 is that the quantity of lead tetraethyl, with AVGAS one hundred having the next lead content than AVGAS 100LL.

Fuel for piston-engine powered craft (usually a high-octane fuel referred to as avgas) incorporates a high volatility to enhance its carburetion characteristics and high auto ignition temperature to forestall resignation in high compression craft engines. Rotary engine engines (like diesel engines) will operate with a large vary of fuels as a result of fuel is injected into the new combustion chamber. Jet and turbine (turboprop, helicopter) craft engines generally use lower price fuels with higher flash points, that are less ignitable and so safer to move and handle.

The first axial mechanical device reaction-propulsion engine in widespread production and combat service, the Junkers Jumbo 004 used on the Pine Tree Statesserschmitt Me 262A fighter and therefore the Arad AR 234B jet recon-bomber, burned either special artificial "J2" fuel or diesel oil. Fuel was a 3rd choice however unattractive thanks to high fuel consumption. different fuels used were coal oil or coal oil and fuel mixtures [4].

Water in jet fuel

It is very important that jet fuel be free from water contamination. During flight, the temperature of the fuel in the tanks decreases, due to the low temperatures in the upper atmosphere. This causes precipitation of the dissolved water from the fuel. The separated water then drops to the bottom of the tank, because it is denser than the fuel. Since the water is no longer in solution, it can form droplets which can supercool to below 0°C (32 °F). If these supercooled droplets collide with a surface they can freeze and may result in blocked fuel inlet pipes. This was the cause of the British Airways Flight 38 accident. Removing all water from fuel is impractical; therefore, fuel heaters are usually used on commercial aircraft to prevent water in fuel from freezing [5].

There are several methods for detecting water in jet fuel. A visual check may detect high concentrations of suspended water, as this will cause the fuel to become hazy in appearance. An industry standard chemical test for the detection of free water in jet fuel uses a water-

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sensitive filter pad that turns green if the fuel exceeds the specification limit of 30 ppm (parts per million) free water. A critical test to rate the ability of jet fuel to release emulsified water when passed through coalescing filters is ASTM standard D3948 Standard Test Method for Determining Water Separation Characteristics of Aviation Turbine Fuels by Portable Spirometer.

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