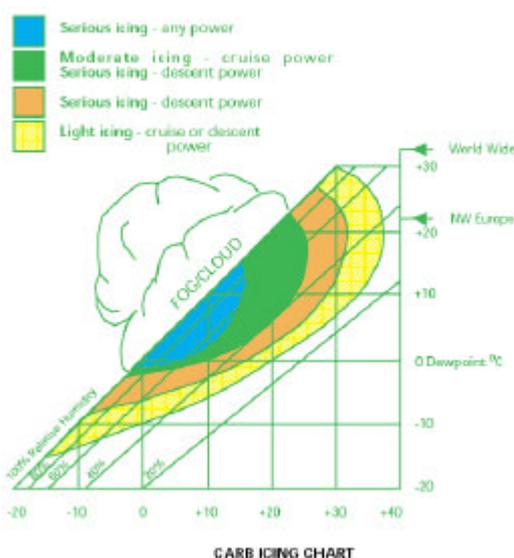


# Jet-Tech Motorsport

## Jet-Tech – Carb Ice Warning Message

All engines with carburettors can, given the right atmospheric conditions, suffer from carb-ice and often you may not even realise that you have, as on returning to the pits any carb-ice would quickly melt as a result of heat sink from the engine. All that you would be left with in these cases is an unexplained progressive lost of engine power coupled very poor throttle response in your last track session.



To the left is a Carb Icing chart produced by the UK Civil Aviation Authority. Sadly carb ice has over the years killed many pilots and whilst our problems will not have such serious consequences carb-ice can ruin your days racing.

Carb-ice is caused as the carburettor vaporizes fuel; it cools the intake air by evaporation. The carburettor venturi also cools the air by adiabatically expanding the intake air, known as the Joule-Thomson Effect. If the air temperature drops below the dew point temperature, moisture in the air condenses into water droplets. Thus, water can be present in the carburettor even when racing under clear skies.

Ice forms near the carburettor slide when water droplets strike parts of the carburettor (typically the slide and venturi) that are very cold. This temperature is determined by: the outside air temperature, the temperature drop, and heat absorption from the engine. With the throttle partly closed, such as in the braking zone, you may have a 200mb pressure drop across the throttle slide.

The more fuel the carburettor evaporates, the colder the carburettor. The heat loss from evaporation of fuel at the perfect fuel ratio that **Jet-Tech Pro or Max** will give you, creates a theoretical temperature drop of 5 degrees C which is normally very good news when you are trying to get the maximum power from your engine. The adiabatic expansion of gas across the carburettor's venturi also lowers the temperature. Thus, you could drop the carburettor temperature to freezing and form carburettor ice at an ambient temperatures of 22C or higher. For further information try <http://www.caa.co.uk/> or the many other aviation web sites.

So that's the brief explanation, what can we do about the potential impact on our days racing?

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Well pilots have hot air systems (carb heat) to switch on when flying in these conditions, we could of course try to rig up a similar system but it would be complicated, add weight and may fall foul of the Race Scrutineers. Also hot air induction and engine power do not sit well with each other.

So what can we do? Well the first thing, is to be aware of the potential problem, which is why the carb-ice warning feature has been built into **Jet-Tech Pro and Jet-Tech Max**.

If the conditions have the potential for carb-ice to form, then the carb-ice warning will appear above the needle clip position as illustrated to the right. Remember if you have poor engine performance when the carb-ice warning is showing and you have checked all the usual areas and cannot resolve the problem, then carb-ice formation is likely to be the answer.

You can significantly reduce the risk of carb-ice forming by ensuring that the minimum amount of water spray enters the engine and making sure that the fuel is not contaminated with even the smallest amount of water.

Cleanliness as ever remains an issue, as carb-ice will form more readily if it has a tiny speck of dirt to form nucleus for the subsequent ice formation.

I would always advise that you use the full slide opening when the carb-ice warning is displayed and if possible use the 12.5 venturi carb, again with full slide opening. Remember the Joule-Thomson effect I explained above, you can reduce the venturi cooling effect by slowing the airflow and a bigger carb or venturi opening will slow the airflow.

Be fast and stay safe.

