Octane Measurement Methods

Research Octane Number (RON)

The most common type of octane rating worldwide is the **Research Octane Number** (**RON**). RON is determined by running the fuel in a test engine with a variable compression ratio under controlled conditions, and comparing the results with those for mixtures of iso-octane and n-heptane.

Motor Octane Number (MON)

There is another type of octane rating, called **Motor Octane Number** (**MON**), or the aviation lean octane rating, which is a better measure of how the fuel behaves when under load as it is done at 900 rpm instead of the 600 rpm of the RON. MON testing uses a similar test engine to that used in RON testing, but with a preheated fuel mixture, a higher engine speed, and variable ignition timing to further stress the fuel's knock resistance. Depending on the composition of the fuel, the MON of a modern gasoline will be about 8 to 10 points lower than the RON. Normally, fuel specifications require both a minimum RON and a minimum MON.

Anti-Knock Index (AKI)

In most countries, including all of those of Australia and Europe the "headline" octane rating shown on the pump is the RON, but in Canada, the United States and some other countries, the headline number is the average of the RON and the MON, called the **Anti-Knock Index** (**AKI**). It may also sometimes be called the **Road Octane Number** (**RdON**), **Pump Octane Number** (**PON**), or **(R+M)/2**.

Difference between RON and AKI

Because of the 8 to 10 point difference noted above, the octane rating shown in the United States is 4 to 5 points lower than the rating shown elsewhere in the world for the same fuel. See the table in the following section for a comparison.