# Rech Bulletin

World Leader in Race Fuel Technology™

Tech Bulletin prepared by Steve Burns, Research & Development

## Q16 Racing Fuel

**Q16 is simply the best drag race fuel ever made.** And coming from VP Racing Fuels, that's a <u>big</u> statement. Q16 represents true world class technology. With more power, octane and consistency, Q16 will work well not only in drag racing, but circle track and off road, spanning the application range better than any fuel ever made—from naturally aspirated to nitrous to blowers. It's recommended for engines with compression ratios up to 17:1.

**Power** – Q16 has 10% oxygen content by weight, requiring a 4-6% increase in fuel flow, which contributes to making **3-5% more power than competitors' 116 octane** *fuels.* With its rapid vaporization rate, Q16 has superior burning speed and makes more pressure in the cylinders, both of which also make more power. Q16 still has relatively low vapor pressure, unusual in a fuel with an oxygen content and vaporization rate this high.

**Octane** – Q16 has a motor octane of 116, virtually the same as VP's C16, but its resistance to detonation is even better—6 to 8 numbers higher than its standard ASTM rating—due to the increased fuel flow. This is particularly relevant to circle track, dirt track and off road racing where radiators and air ducts can get clogged by dirt and debris. While this occurs during the course of a race, octane requirements will change, but Q16's effective octane rating will preclude detonation throughout such conditions. Notably, Q16 also will contribute to lower engine operating temperatures due to more efficient combustion which yields lower exhaust gas temperatures.

**Consistency** – Due to its oxygenated compounds and better vaporization, Q16 offers a wider air-fuel ratio and improves fuel distribution cylinder to cylinder. This means a **Q16-powered vehicle will be much more consistent run to run and won't vary as dramatically with altitude or density changes.** In bracket cars that vary .02-.04 in

Property	Typical	Test Methods
Specific Gravity @ 60F°	.716	ASTM D 4052
Motor Octane	116	ASTM D 2700-86
Reid Vapor Pressure	6.76	ASTM D 323
Distillation F°		ISO 33405
10% Evap.	141.0	
50% Evap.	174.0	
90% Evap.	214.5	
E.P.	260.2	
Oxygenated	Yes	
Leaded	Yes	ASTM D 3237
Color	Yellow	

ET during the day, Q16 has routinely demonstrated it will cut the variation in half, to .01-.02.

In terms of overall performance, a vehicle switching to Q16 can expect to see <u>substantial</u> improvements. A typical 550 in. drag race engine will pick up about 30 peak Hp and .03-.04 in ET in the 1/8 mile.

Q16 is priced about the same as competitors' 116 octane fuels, but will outperform them all. In the context of a racer's budget, even if Q16 is \$4/gallon higher than your current fuel and you use <sup>3</sup>/<sub>4</sub> gallon per pass, you'll only spend an extra \$3 per pass for a .03-.04 gain. That's the cheapest horsepower gain you can buy!

### If you're not bound by fuel rules, Q16 is truly the only fuel you should be using.

Technical questions on application and tuning of Q16 can be directed to VP's Technical Department at 812-878-2026 or <u>tech@vpracingfuels.com</u>. Questions regarding purchase and delivery of Q16 can be directed to the appropriate VP regional distribution center, each of which is listed with contact information on VP's website – *vpracingfuels.com*. Q16 is available in 5-, 15-, 30- and 54 gallon drums, as well as bulk.

To maintain the original properties and comply with Health and Safety regulations, this fuel should be handled and stored in a cool place and always maintained in tightly sealed drums.

VP RACING FUELS, SAN ANTONIO, TEXAS, USA TEL: 210-635-7744; FAX: 210-635-7999 www.vpracingfuels.com

Headquarters: San Antonio, Texas.

Offices in Delaware, Indiana, California, Georgia; independently owned VP Distribution Centers in Florida, Kansas and Washington; Calgary, Montreal and Toronto, Canada; Sydney, Australia

#### The four most important properties of racing fuel

You can't make a racing fuel that has the best of everything, but you can produce one that will give your engine the most power. This is why we produce different fuels for different applications. The key to getting the best racing gasoline is not necessarily buying the fuel with the highest octane, but getting one that is best suited for your engine.

- OCTANE The rating of fuels' ability to resist detonation and/or preignition. Octane is rated in Research Octane Numbers (RON), Motor Octane Numbers (MON), and Pump Octane Numbers (R+M/2). Pump Octane Numbers are what you see on the yellow decal at the gas stations and represents an average of RON and MON. VP uses MON because this test method is more prevalent in racing. Most other companies use RON because it is higher, easier to come by, and sounds better in marketing messages. Don't be fooled by high RON numbers or an average -- MON is the most important for a racing application. However, the ability of the fuel to resist preignition is more that just a function of octane.
- 2. BURNING SPEED The speed at which fuel releases its energy. In a high-speed internal combustion engine, there is very little time (real time - not crank rotation) for the fuel to release its energy. Peak cylinder pressure should occur around 20° ATDC. If the fuel is still burning after this, it is not contributing to peak cylinder pressure, which is what the rear wheels see.
- 3. ENERGY VALUE An expression of the potential in the fuel. The energy value is measured in BTUs per pound, not per gallon. The difference is important. The air fuel ratio is in weight, not volume. Remember, this is the potential energy value of the fuel. This difference will show up at any compression ratio or engine speed.
- 4. COOLING EFFECT: The cooling effect on fuel is related to the heat of vaporization. The higher the heat of vaporization, the better its effect on cooling the intake mixture. This is of some benefit in a low rpm engine, but can be a big gain in high rpm engines.

#### The VP Racing Fuels Story

For more than 30 years, VP's passionate dedication to technological innovation through R&D has set it apart from every other race fuel company. We started with the philosophy that the only thing that counts is winning and that continues to this day.

VP works directly with racers at the track and on their dynos. It's how we started and continues to be our M.O., with most of our R&D accomplished in this manner. True champions leave no stone unturned in their drive to win. That's why more champions in more forms of motorsports choose to work with VP than any fuel company in the world.

Claiming world leadership in technology might seem like a stretch until you look at the range of applications for which VP has developed top performing fuels and now sells in more than 30 countries around the world. Take NHRA Pro Stock, where VP has dominated for three decades and was ultimately chosen as the spec fuel for the world's most advanced engines in a stock application. Or take VP's Late Model Plus, which in just three years has become a dominant fuel in dirt track racing and no competitor has been able to match. Or the challenging world of motorcycles, which includes dirt bikes, road race bikes, 2-stroke, 4-stroke, single cylinder, multicylinder, high rpm or low rpm. For the last three years, 100% of AMA's championships across all Pro classes have been won on VP-powered machines. Much of VP's technology in motorcycle fuels has been transferred to automotive applications and with many of the best young minds involved with the technological developments in motorcycle racing, our work in this area keeps us ahead of most competitors on the learning curve.

VP's commitment to R&D goes far beyond making a profit. It's about being the best -- and knowing that with delivery of the best quality, performance and consistency, profits will follow. That's why R&D and Quality Control are two of VP's biggest expenditures. And why those budgets will never be cut. After all, racing is built on technology. And technology in racing fuels drives our company. There's a reason VP offers more than 60 blends of racing fuel today – each of them came out of R&D with specific teams. The good news is it's likely we've already developed the best available fuel for <u>your</u> application. But rest assured, if your application is so unique it requires creating a new fuel, that's exactly what we'll do.

For questions regarding fuel recommendations or tuning, contact VP's Technology Director at 812-878-2026 or <u>tech@vpracingfuels.com</u>. VP's unsurpassed quality, performance and consistency were built on world leading race fuel technology -- technology available to <u>you</u>. Put VP to work for your team today.



#### Advancing the Science of Motorsports™

8/07