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COMPLIANCE ADVISORY FOR BLENDING OF DIFFERING OCTANE LEVELS FOR GASOLINE RETAILERS AND TRANSPORTERS

Recently the Department has issued Notices of Violations to retail station owner/operators and fuel transporters for non-compliant blending of gasoline as summarized below:

- *In-dispenser blending*: blending an 87 octane with a 91 octane to produce an 89 octane where the dispenser blend ratio is not set correctly.
- *Transporter blending*: delivery drivers blending 85 or 86 octane gasoline obtained from other states with 91 octane to produce an 87 or 89 octane for sale to consumers. In some cases delivery drivers are only delivering the sub-octane gasoline, such as the 85, 86 or 88 octane, and not delivering the higher octane gasoline to meet the octane requirements for the gasoline being sold to consumers. In other cases, the delivery driver is blending the higher octane gasoline, but not in sufficient quantities.

These actions can put the station owner and transporter at risk for Notice of Violations and associated penalties.

Provided below is information to assist station owners/operators and transporters of the requirements for blending gasoline with differing octane levels to demonstrate that consumers are receiving the gasoline meeting the minimum octane as advertised.

Station Owners/Operators:

1. Arizona requires a minimum 87 octane for sale to consumers. Always review Product Transfer Documentation (PTDs) to ensure that the minimum standard is met.
2. You must post on the dispenser the octane rating of the gasoline consistent with the minimum octane rating certified to you in the PTD.
3. When blending gasoline with other gasoline, you must post consistent with your determination of the average, weighted by volume, of the octane ratings certified to you for each gasoline in the blend, or consistent with the lowest octane rating certified to you for any gasoline in the blend. The octane rating must always be equal to or less than the number certified; therefore, you are not allowed to round up when calculating octane ratings for blended gasoline. Alternatively, you may choose to certify the gasoline by sampling and analysis following the appropriate ASTM test methods. See the attachment for examples on calculating the octane level in blended gasoline.
4. If blending differing octane levels within a dispenser, ensure the blend ratio is set correctly. For example, it should be 50% 87 octane and 50% 91 octane to produce an 89 octane for sale to consumers.

5. Always review the PTDs to ensure the octane certification is clearly stated. If gasoline is blended, the PTDs should show the blend ratio and the minimum octane rating of the blend. Additionally, the PTDs should show the quantities of gasoline delivered to each tank.
6. As the station owner/operator, you are responsible to ensure the gasoline sold meets the octane requirements advertised to consumers.

Transporters:

1. Each time custody or title of motor fuel is transferred, the PTDs shall include the minimum octane rating of the gasoline.
2. When blending gasoline at a retail facility, the PTDs shall clearly demonstrate how the gasoline is being blended to meet the minimum octane requirements. The minimum octane rating of the blended fuel should be clearly stated on the PTDs. Alternatively, attach a letter of certification stating the minimum octane rating for the blended fuel to accompany the delivery.
3. The fuel delivered should meet the requirements of the fuel being sold to the customer, as labeled on the storage tank fill pipe. For example, if the tank fill pipe is labeled "unleaded" the gasoline delivered should be certified a minimum of 87 octane.

An example demonstrating one method of documenting on PTDs the blending of octane during delivery, as well as how to calculate blended octane levels, is attached.

This document is intended to provide a brief summary of the requirements for blending differing octane levels and is not intended to replace or supersede federal, state, or local regulations.

References:
R20-2-704 Price and Grade Posting on External Signs
R20-2-705 Price, Octane, and Lead-substitute Notification on Dispensers
R20-2-707 Product Transfer Documentation and Record Retention for Motor Fuel other than Arizona CBG and AZRBOB
 R20-2-757 Product Transfer Documentation; Records Retention
16 CFR Part 306 Automotive Fuel Ratings, Certification, and Posting

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Example of Product Transfer Documentation Demonstrating Gasoline Octane Blending

This example demonstrates the minimum octane of blended gasoline and clearly shows the delivery of the correct amounts of gasoline to each tank with the correct blending to meet minimum octane requirements. While there are no standards for the layout of the product transfer documents, the information contained on the documentation should be clear to demonstrate how gasoline was blended, the quantities, and to which tank the gasoline was delivered.

Clearly shows the minimum octane rating of 87

Shows the percentage of each grade of gas blended

Remark:	Ordered	Gross	Net	BOL

Splash Blend CONV UNL 87/ 10% ETOH
    80% UNL 86 / 10% ETOH
    20% UNL 91 / 10% ETOH
	6,000	5,900	5,891	XXXXX

Splash Blend CONV UNL 89/ 10% ETOH
    40% UNL 86 / 10% ETOH
    60% UNL 91 / 10% ETOH
	1,200	1,200	1,200	XXXXX

Shows the amount of each grade of gas loaded to each compartment on the delivery truck

Compartment	1	2	3	4
Gross/Net Gallons	2,600/2,596 UNL 86	480/480 PRE 86	2,120/2,115 UNL 86	
	650/650 PRE 91	720/720 UNL 91	530/530 PRE 91	

Shows the amount delivered to each tank. Matches the amount loaded.

Tank Stick Readings	Before	After	Delivered
Unleaded 87	XXX	XXX	5,900
Midgrade 89	XXX	XXX	1,200

Calculation of Octane in Blended Gasoline

Following is an example for calculation of the octane of blended gasoline weighted by volume. In this example both grades of gasoline contain the same volume of ethanol. Blending gasoline with differing volumes of ethanol or other oxygenates may change this calculation and it is recommended for further review. The final octane must meet the requirements, without rounding.

Example 1:   X = 2,000 gallons 87 octane, Y = 2,000 gallons 91 octane

$$\frac{(X * \text{octane of } X) + (Y * \text{octane of } Y)}{(X + Y)} = \text{Final Blend Octane} \qquad \frac{(2,000 * 87) + (2,000 * 91)}{4,000} = 89 \text{ octane}$$

Example 2: X = 8,000 gallons 86 octane, Y = 2,000 gallons 91 octane

$$\frac{(X * \text{octane of } X) + (Y * \text{octane of } Y)}{(X + Y)} = \text{Final Blend Octane} \qquad \frac{(8,000 * 86) + (2,000 * 91)}{10,000} = 87 \text{ octane}$$