

Ten organizations and individuals submitted comments on the proposed first edition of Ethanol Guidelines from the Worldwide Fuel Charter (WWFC) Committee. All comments were carefully reviewed for appropriate action. For brevity, the following discussion has been organized by concept rather than repeatedly responding to similar comments. Several helpful editorial and technical corrections were adopted but are not described in this document. For reasons of confidentiality, the individual commenters are not identified. As with the WWFC, the Ethanol Guidelines represent recommendations for a global market, and as such, will differ from the standards of any particular country or location.

#### General Comments on the Ethanol Guidelines

**Comment:** Some countries are allowing E10+ and properties won't change much, so the Guidelines should allow some flexibility.

**Response:** The Guidelines are intended for the use of ethanol as a blending component with gasoline at rates up to 10% by volume, only. Higher concentrations would require significant additional evaluation to determine whether they are appropriate for use in engines and vehicles not originally designed for such fuels.

**Comment:** Ethanol is not the only biofuel available for blending with gasoline. The Guidelines should add information about ether bio-oxygenates (e.g., ETBE, TAEE). Ethanol quality is also important in producing ether blendstocks.

**Response:** While other renewable fuels are being developed, ethanol as a blending component for gasoline is being produced and distributed worldwide today in significant quantities. The Committee decided to make ethanol the focus of these Guidelines.

**Comment:** The Guidelines are more restrictive than standards in 3 main markets (US, EU and Brazil), so they would be difficult to implement.

**Response:** The Guidelines are intended to provide information regarding all parameters that are involved in defining a quality blendstock. All parameters may not be applicable to a specific region, but if met in total, they would facilitate worldwide ethanol distribution.

**Comment:** ASTM D4806 and D5798 provide adequate guidance on ethanol blendstock quality. Guidelines are not needed.

**Response:** The Committee disagrees. Many properties important to the operation of current high technology engines and vehicle systems are not included in the current ASTM standards.

**Comment:** In the U.S., a purity of 99.2% is unachievable due to denaturant requirement (1.96% - 5.0%).

**Response:** The Guidelines apply to E100, i.e., before denaturants are added.

Comment: The Guidelines should not limit anhydrous saturated C3-C5 alcohols to max 2% because higher alcohols may be more compatible with vehicles and less costly to produce.

Response: This is guidance for ethanol, not for all alcohols.

Comment: Many at tripartite think a 0.3% water limit is too restrictive. California uses 0.6% as the limit for 5.7% ethanol blends. No phase separation has been reported down to -15°C. Such a low limit would restrict product availability and increase cost; it may also require driers on tanks.

Response: Strict water content limits are important to assure acceptable fuel quality at all ambient conditions. Also, careful shipping and handling practices should be monitored to protect against picking up additional water in transit.

Comment: Several commenters raised questions regarding a conductivity limit and the need for additional limits on certain metallic ions.

Response: The Committee believes that the max limit for electrical conductive species as a whole is needed. In addition, limits for some corrosive ions are defined.

Comment: Various comments related to the inclusion of a sulfate requirement.

Response: The Committee believes blenders should check sulfate in the ethanol blendstock prior to blending with gasoline, since the primary source of sulfate in gasoline-ethanol blends is from ethanol production processes.

Comment: Several commenters raised questions regarding the need to monitor heavy metals.

Response: Heavy metals have a severe and significant adverse effect on aftertreatment systems and their performance. The Guidelines highlight this fact to help blenders and others understand why heavy metals should not be allowed to enter motor vehicle fuels.

Comment: CONCAWE has published guidelines regarding housekeeping.

Response: The Committee agrees this is a useful document and has included it in the Guidelines as a reference.