



## LPG Cylinder Safety with DME/LPG Blends in China

Significant commercial developments, primarily in China, have resulted in enormous increases in production capacity, with annual DME production capacity in 2008 estimated to have increased by more than 400% over 2006 figures. This rapid growth is being complimented by a commensurate level of activity by governmental, commercial and industry bodies to ensure that the necessary regulatory and standards guidelines and legislation are in place. More than 90% of DME produced in China is mixed with liquefied petroleum gas (LPG) and consumed as an ultra clean fuel for domestic cooking and heating (blends containing up to 20% DME generally require no equipment modifications for home cooking and heating).

In March of 2008 the Chinese General Administration of Quality Supervision, Inspection and Quarantine issued a "Notification About Refilling Cylinders" that prohibits LPG cylinders from being filled with LPG and DME blends. The notification represents an administrative directive, and not a law under current legislation. This notification was apparently issued in response to leakage and corrosion experienced with some LPG cylinders with new specifications that were holding LPG/DME blends. While some DME producers have stopped blending, there does not appear to be any significant change at a commercial level caused by this event.

Extensive and decades-long research into all aspects of DME's use, handling and delivery when mixed with LPG have demonstrated such blends to be a safe and reliable way to utilize the ultra clean fuel. In the informed view of the International DME Association (IDA), potential causes of the problems reported could include faulty valves, product contamination (e.g. water), or inconsistent production and mixing quality standards. There is a concern that some blenders have been tempted to use higher than recommended percentages of DME due to DME's cost advantages relative to LPG, causing problems related to the solvency characteristics of DME.

China has made significant investments in the development of infrastructure and capacity required to increase the use of DME as an ultra clean fuel in heating, cooking and transportation, and the government is working to adopt standards and policies for DME fuel use. The IDA is aware of government-led research into the matter of the cylinder leakages. Additionally, the IDA is monitoring the technical research being conducted by international and Chinese companies involved in the production, blending, and distribution of DME in China, being done in conjunction with the manufacturers of valves, seals, and cylinders. IDA member the ENN Group continues to work toward the establishment of a single standard for LPG and DME blending, and is working with the relevant authorities in China. In 2006 Totalgaz, the LPG subsidiary of Total France, initiated a study on DME/LPG blends in China. The study was conducted in three stages and included laboratory and, from 2007, on-site tests with customers. The study's preliminary conclusion is that the material compatibility issues with DME/LPG blends can be easily resolved, and the objective now is to complete the research in China and issue formal regulations regarding the cylinder, handling, and allowable percentages of DME to be used in such blends.

The IDA and Chinese DME experts hosted a roundtable discussion on the subject in late September 2008 during their 3<sup>rd</sup> International DME Conference and the 5<sup>th</sup> Asian DME Conference in Shanghai, and heard from key players involved in the issue from both government and industry. The roundtable participants stressed that they are working on an agreement, and the introduction of national blending and cylinder standards for introduction in the first half of 2009.