The European Association of Internal
Combustion Engine Manufacturers

EUROMOT

POSITION PAPER

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Additional Information regarding:

Preliminary Consultant Report on Cost-Benefit Assessment of Gas Quality Harmonization in the EU

1 Introduction

EUROMOT has been actively participating in the consultations for the cost-benefit of gas quality harmonization and has provided information regarding the impact on internal combustion engines [1]. The key aim of this second paper is to provide further information on national gas rules in the U.S.A. which are preferable to the gas specifications proposed in the EASEE-gas Common Business Practice (EASEE-gas CBP).

2 Natural gas interchangeability rules in the USA

On February 28, 2005, the U.S. Natural Gas Council and a large Interchangeability Working Group consisting of gas suppliers, users and manufacturers of gas-fuelled equipment published a White Paper on the interchangeability of natural gases. The reason for this work was the expected substantial imports of liquefied natural gas (LNG) from diverse sources all over the world. As the imported LNGs vary substantially in composition, it was feared that the proper functioning of gas-fired equipment would suffer, resulting in damage, lower efficiency, higher emissions and potentially dangerous situations. Based on this, the U.S. Natural Gas Council together with the Federal Energy Regulatory Commission (FERC) set limits in their interim guidelines for a number of gas indices values: The Wobbe Index of the gas, the higher heating value, the amount of higher hydrocarbons (C4+) and the total amount of inert components, such as nitrogen and carbon dioxide [see table1]. In the table below, the

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American interim guideline is compared to some of the EUROMOT recommendations regarding the gas specifications necessary for stationary gas engines. The U.S. interim guidelines are close to the EUROMOT's proposals.

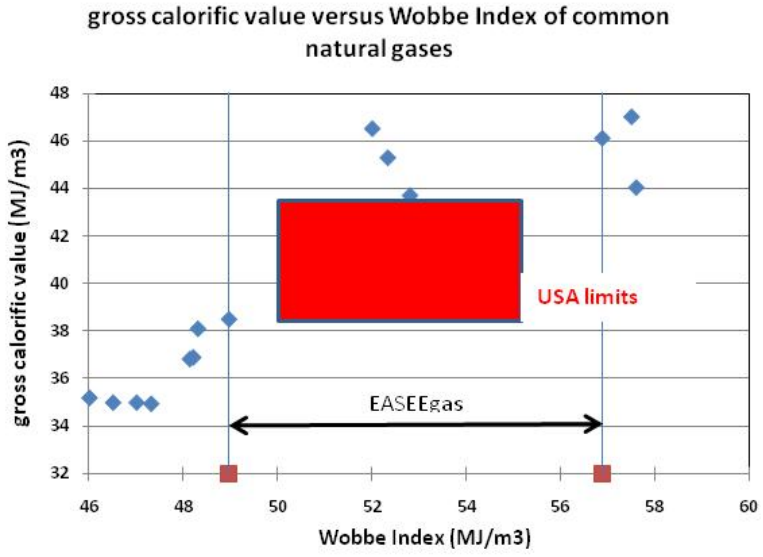
Table 1: Limits in gas indices values in the USA (FERC Interim Guidelines)

Index	**US Limit value**	EUROMOT Recommendation [1]
Wobbe Index	**Max 55.06 MJ/m3**	
Wobbe Index Range*	***+/- 4%***	+/- 2%
Methane Number*	**Min 75**	Minimum MN 80
Higher heating value	**Max 43.25 MJ/m3**	
C4+ gases	**Max 1.5 mol %**	
Inert components	**Max 4%**	CO2 + N2, 2.5+2.5= **5%**
* Due to the maximum in inert components, the Wobbe index can never be lower than 50.6 MJ/m3.The range of the Wobbe Index is therefore +/- 4% **The methane number is not directly regulated. However, for a maximum Wobbe Index of 55.06 MJ/m3 and a maximum of C4+ gases of 1.5%, the Methane Number, which is a measure of knock resistance, will always be above MN 75.		

Due to the maximum in inert components, the Wobbe index can never be lower than 50.6 MJ/m3 and the higher heating value never lower than 38.2 MJ/m3. The range of the Wobbe Index is therefore +/- 4% and the range in the higher heating value never exceeds +/- 5.6%.

Due to the substantial increase in exploration and production of U.S. shale gas, the expected LNG imports never materialised. **Nevertheless the rules established still apply today.** The increase of shale gas, however, also raises concerns because of the large variations in composition experienced depending on location and time.

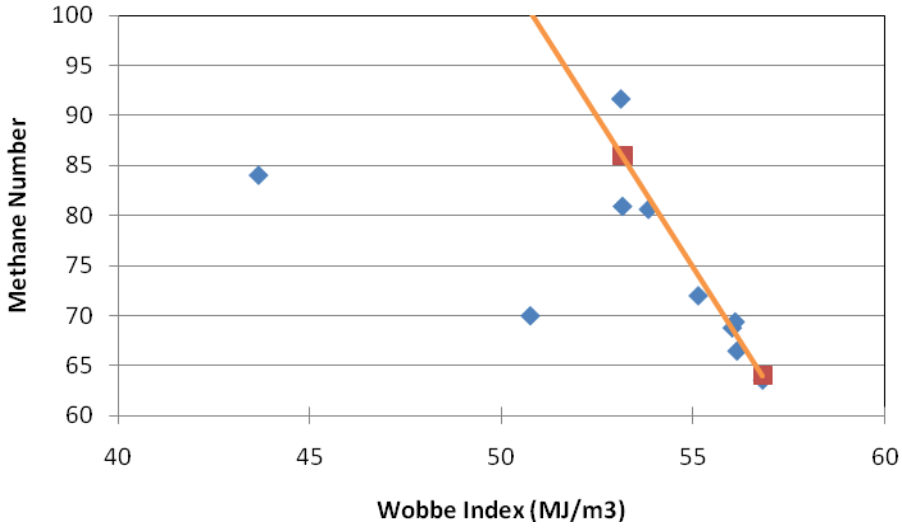
Figure 1: Substantially narrower limits for interchangeability of gases in the USA than proposed by EASEE-gas in Europe



3 Conclusion

The range in Wobbe Index in the USA is substantially smaller than the range proposed by EASEE-gas in Europe [Figure 1]. EUROMOT believes that this better reflects the needs of gas users and gas equipment manufacturers than the EASEE-gas specifications. Because of the narrow limits in the USA, the large errors in gas energy measurements expected in Europe will not occur in the USA. Furthermore, the combustion knock problems expected with gas engines in Europe when applying EASEE-gas CBP will not occur in the USA. For a maximum Wobbe Index of 50.6 MJ/m3 and a maximum of C4+ gases of 1.5%, the methane number, which is a measure of knock resistance, will always be above 75. That will not affect engine operation even if the efficiency of the engine will decrease to a certain extent compared to methane numbers above MN 80. For the EASEE-gas range, the methane number can be as low as 63, resulting in serious performance problems.

Figure 2: Low Methane Numbers possible with the proposed EASEEgas range.



EUROMOT believes that the U.S. Natural gas interchangeability rules have great advantages, especially a much more acceptable gas index range than the proposed EASEE-gas CBP. This is the result of close co-operation of experts of all stake-holders, users, manufacturers as well as suppliers.

References

1. EUROMOT position paper on gas quality, available at: http://www.euromot.org/download/ec4913cb-48f7-45ad-8aae-b5f5fe69cc10/GAS%20QUALITY%20euromot%20position%202011_05.pdf

2. Darin L. George and Edgar B. Bowles, 'Shale Gas Measurement and Associated Issues', Pipeline & Gas Journal, pp. 38-41, July 2011

3. Natural Gas Council, White Paper on Natural gas Interchangeability and Non-Combustion End Use, February 28, 2005.

EUROMOT is the European Association of Internal Combustion Engine Manufacturers. It is committed to promoting the central role of the IC engine in modern society, reflects the importance of advanced technologies to sustain economic growth without endangering the global environment and communicates the assets of IC engine power to regulators worldwide. For more than 20 years we have been supporting our members - the leading manufacturers of internal combustion engines in Europe, USA and Japan - by providing expertise and up-to-date information and by campaigning on their behalf for internationally aligned legislation. The EUROMOT member companies employ all over the world about 200,000 thoroughly skilled and highly motivated men and women. The European market turnover for the business represented exceeds 25 bn euros. Our **EU Transparency Register** identification number is **6284937371-73.**

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