

Gas quality fluctuation from the point of view of thermo- process equipment manufacturers

Ensuring adequate supplies of natural gas for domestic and industrial users in the future is a challenge that needs to be tackled. On the one hand, a reduction in energy consumption can contribute to meeting this challenge and this approach has already been successfully practised for some time. On the other hand, it will be necessary to develop new sources of energy in addition to those currently on the market and to make them available to users.

The EU took up the idea of secure supplies of group H natural gas ("H-gas") and requested CEN to develop a standard with mandate M 400. The objective of this standard is to define the technical limits for acceptable gas quality. Both technical and economic parameters are to be taken into consideration. The responsible working group is CEN/TC234/WG11.

This standard appeared in 2015 (EN 16726) and is now being implemented on a national basis (e. g. in Germany as DIN EN 16726).

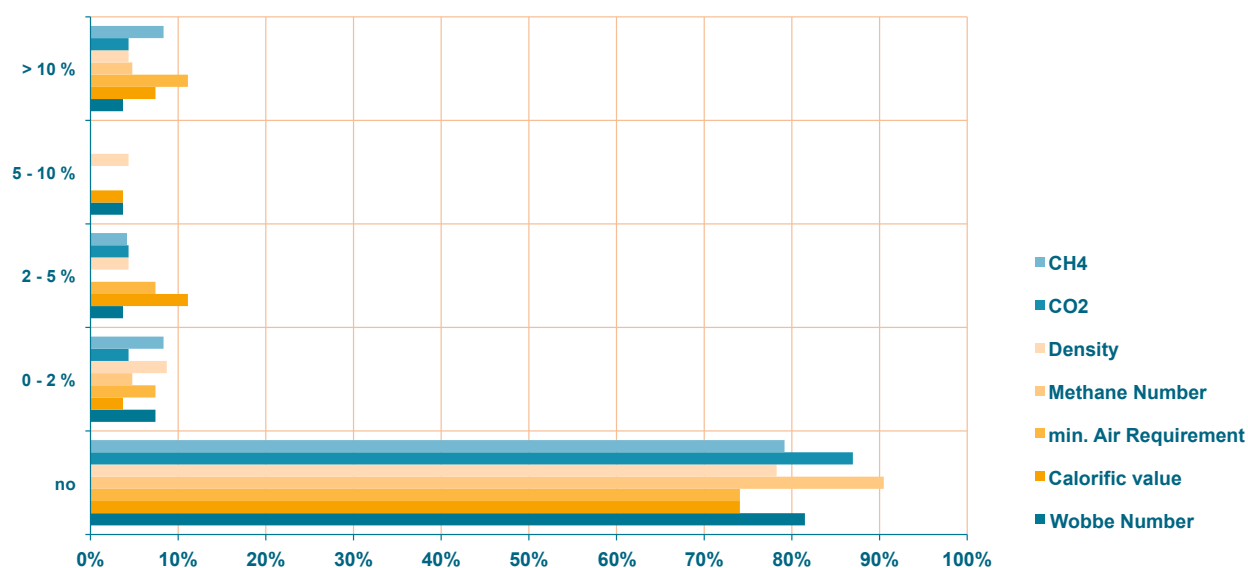
To date, the EU member states have had national provisions concerning gas quality. On a national basis, it will be necessary to decide whether the new European standard and the national provisions need to be adapted to each other. Although EN 16726 was drawn up under mandate M 400, there is no obligation to apply this standard at the European or national level. In a further

step, which has been initiated by the EU commission, a binding status is to be established.

Both, CECOF and CEN/TC186 were involved in the development of EN 16726 as representatives of the thermoprocess sector. Within CEN/TC234/WG11, the different requirements concerning gas quality and quality fluctuation from the point of view of energy suppliers, distributors, wholesalers etc. on the one hand and domestic and industrial consumers and their manufacturers concerned on the other hand became clear.

The energy supply sector, on the one hand, would like the gas quality range defined to be sufficiently wide to ensure that all H-gas, wherever it is produced (including LNG), may be fed to the natural gas system in Europe and distributed. In addition, fluctuation in gas composition are to be accommodated within a range which has not yet been defined.

On the other hand, manufacturers of thermoprocess equipment design equipment for operation with gas of a constant quality (gross calorific value/net calorific value but not the Wobbe number) without any fluctuation in gas composition. Normally, manufacturers base the design of their equipment on a gas quality specified by their customers or the plant operators. This was confirmed by



Source: VDMA May 2016

Fig 1: Which gas quality fluctuation is automatically adjusted by your furnace control equipment*?

(*Answer to a questionnaire by the German manufacturers of thermoprocess equipment and industrial burners)

a representative survey of thermoprocess equipment and burner manufacturers carried out by VDMA (Fig 1). Fluctuation ranges are not specified and are not taken into consideration in equipment design. The safety requirements for the design of industrial firing and fuel handling systems are defined in EN 746-2 in Europe and, globally, in ISO 13577-2.

If a thermoprocess equipment is equipped with a manual, mechanical or pneumatic gas/air control device, fluctuation in gas quality cannot be accommodated automatically.

In practice, gas quality fluctuation (based on the Wobbe number) of the order of +/- 2.5 % on average already occur in Germany. It would be necessary to obtain similar figures for other European countries. In many cases, this fluctuation has no impact on equipment safety as long as the gas/air ratio is sufficiently high. A high gas/air ratio results in higher energy costs and the production of more CO₂. However, the impact of this gas quality fluctuation on the quality of products from the equipment concerned needs to be investigated in each individual case.

It would be beneficial if gas sensors for the online measurement of gas quality and fluctuation were available at reasonable

costs. These sensors could then be added or retrofitted not only to thermoprocess equipment which use large quantities of gas but also to smaller equipment.

At the "request" of the EU Commission, EN 16726, which appeared recently, is being revised immediately as it only states requirements concerning the methane number and does not define any other combustion parameters. Even the Wobbe number was not defined as the working group could not agree on a range.

In its request for the revision of EN 16726, the EU Commission has stated that thermoprocess equipment safety and product quality are to be given equal priority to the security of H-gas supplies in Europe.

With these aims in mind, CECOF has been involved in the process to date and will continue to be involved in the future.

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