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26 February 2024

To whom it may concern,

Use of Commercial Propane

We refer to our previous notice dated 22 December 2023, concerning reports of users experiencing residue build-up in the vaporisers of forklift trucks.

Since then, as a diligent and responsible provider of commercial propane to the UK market, Phillips 66 Limited (**P66**) has continued to investigate the reported issues and has been assisting the Health and Safety Executive (**HSE**) with its investigations. The investigations are necessarily complex, given the nature of the reported issues and the difficulties in tracing the various sources from where different end users may have obtained their propane.

Nevertheless, the investigations have included examining samples for specific markers to understand if some end users may have received commercial propane from the Humber Refinery. In addition, the HSE provided samples to P66 to test at our research centre due to our access to hi-tech techniques and we have examined them for particular compounds which the HSE believed may be present.

Residue Sample Testing Update

As part of our investigations P66 has evaporated large volumes of commercial propane from the Humber Refinery to produce residue which can then be compared with the residue samples provided to us by the HSE.

Testing has been undertaken which indicates that the residue from the commercial propane produced at the Humber Refinery has a composition profile containing what are believed to be specific marker species, which include polar/aromatic compounds. These are compounds characterised by the presence of heteroatoms (oxygen, nitrogen, sulphur) and/or "rings" of carbon atoms. A sample from the Refinery has been compared with five samples provided by the HSE from end users of propane. The HSE residue samples appear from the testing to have a similar composition profile to that of the Refinery sample, whereas so far as P66 is aware propane from other sources may not contain these polar/aromatic compounds (albeit P66 has limited information about the composition of propane from other sources). This indicates that some of the propane used by the end users from whom the HSE has provided samples is likely to have come from the Humber Refinery.

P66 has also undertaken testing to analyse the make-up of propane residue from the Refinery and that in the HSE's samples. That testing found that almost all of the residue in the propane from the Refinery was made-up of polar/aromatic compounds. By contrast, circa 35% to 70% of the residue in the HSE's samples was made-up of polar/aromatics, with the rest of the residue being made-up of varying amounts of plasticisers, plastic antioxidants, polyglycols and lube oil. The reason for this is still under investigation.

We have also examined the Refinery and HSE samples for the presence of specific compounds which the HSE had identified as being in each of their samples. The testing of the HSE residue samples has confirmed the presence of the following: dioctyl phthalate; didecyl phthalate; dioctyl terephthalate; dioctyl adipate; benzyloctyl adipate; and sulphur compounds including thienothiophenes. A sample from the Refinery contained much lower levels of dioctyl phthalate, didecyl phthalate, dioctyl terephthalate, dioctyl adipate and benzyloctyl adipate than the amounts of those compounds in the



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HSE's samples (although the sample from the Refinery contained a similar proportion of sulphur compounds, including thienothiophenes, to those found in each of the HSE's samples). Whether these compounds play any role in the reported residue build-up is still under investigation.

Conformance with BS 4250

What we can confirm from our regular testing is that all stench commercial propane supplied by P66 to its customers from the Immingham Pipeline Centre has continued to meet the British Standard BS 4250, which ensures that the level of residue in the commercial propane supplied does not exceed the maximum level permitted in such British Standard. P66 carries out regular testing to ensure this compliance.

Safety Data Sheet

Because the compounds found during recent testing include phthalates, terephthalates, adipates and thienothiophenes, we have issued an updated Safety Data Sheet to our customers to include reference to the presence of such compounds in residue from commercial propane supplied by P66. A copy of the updated Safety Data Sheet is enclosed. We draw your attention to the updated text in section 10.6 of the Sheet. This change does not anticipate any additional safe handling controls being required beyond appropriate measures for safe handling of hydrocarbon liquids (for example gloves and good hygiene practices to avoid exposure) and residue should be appropriately disposed of as hazardous waste. We also remind users of the HSE's safety notice about the risk of forklift truck fires, which can be found [here](#). Users should continue to satisfy themselves regarding the suitability of any fuel to be used in their vehicles, plant, equipment or machinery (and as to applicable operating and maintenance procedures).

Summary

The testing which has been undertaken indicates that some of the propane used by the end users from whom the HSE has provided samples is likely to have come from the Humber Refinery. However, the HSE's samples also contained varying amounts of plasticisers, plastic antioxidants, polyglycols and lube oil. The reasons for this and the role this may play in the issues reported by end users remains under investigation. What we can confirm is that all stench commercial propane supplied by P66 remains in compliance with BS 4250.

P66's investigations into this complex issue are ongoing. In the meantime, please share this notice with your members and inform them of the update to the Safety Data Sheet.

Yours faithfully,

A handwritten signature in black ink, appearing to read "R Turner".

Rupert Turner
Managing Director, UK Marketing