

Hydrogen Sulphur content in Fuel Oils by (IP570 / ASTM D7621)



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What is Hydrogen Sulphide?

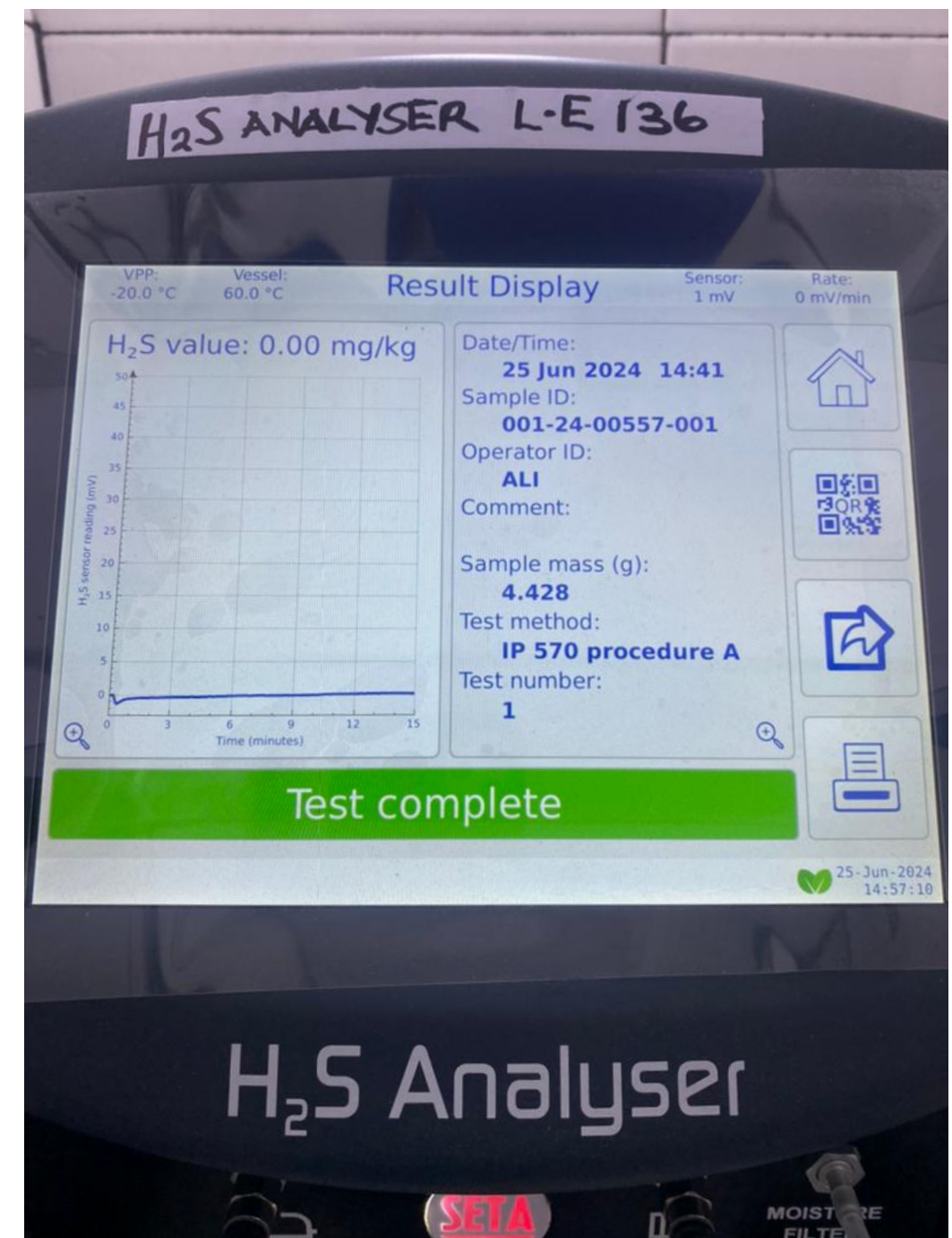
Hydrogen Sulphide (H_2S) is a very dangerous, toxic, explosive, colourless and transparent gas which can be found in crude oil. It can be formed during the manufacture of fuel oil at the refinery and can be released during handling, storage, and distribution. At very low concentrations the gas has the characteristic smell of rotten eggs. However, at higher concentrations it causes a loss of smell, headaches, and dizziness, and at very high concentrations it can be fatal.



Why do we test H₂S?

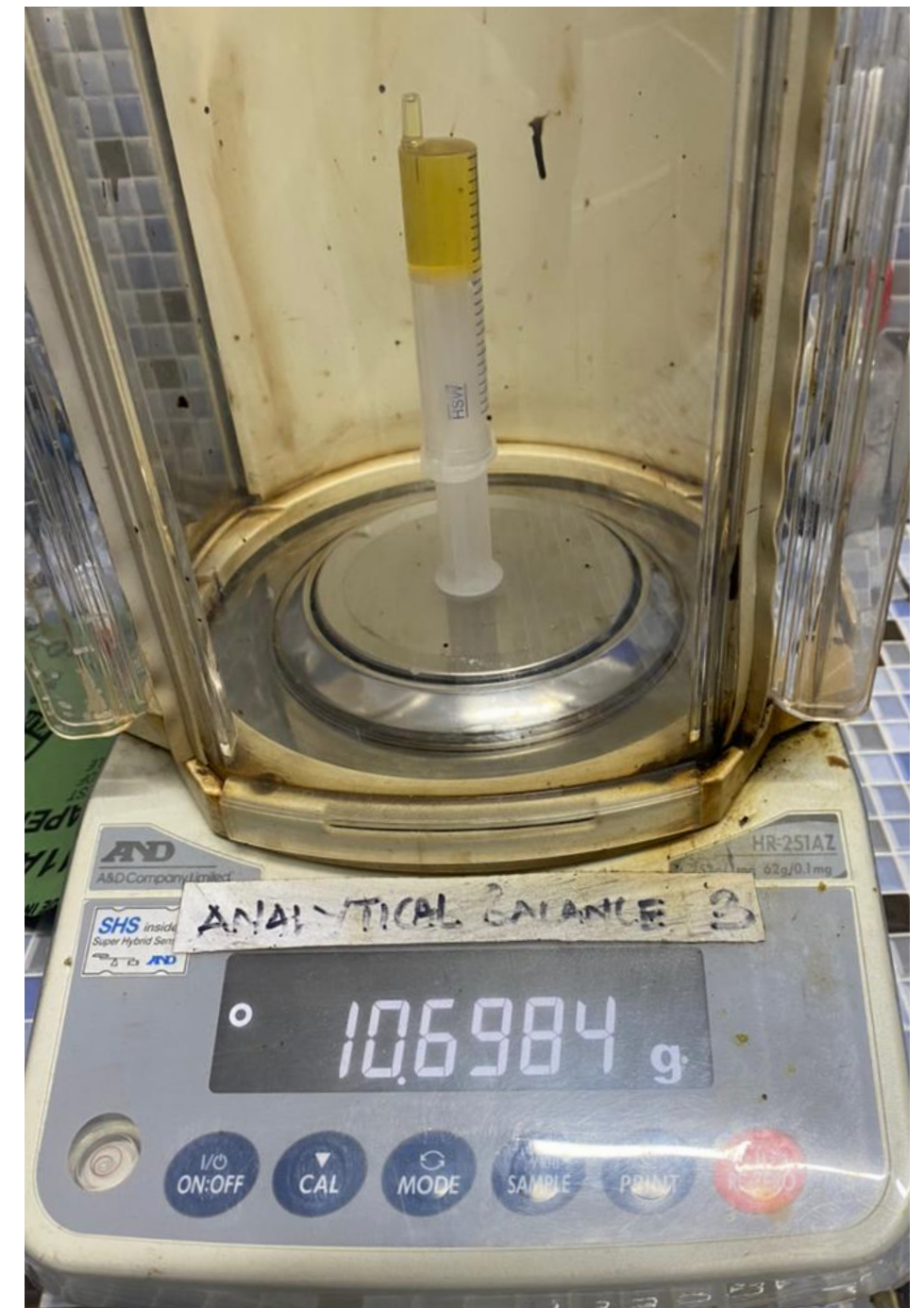
Hydrogen sulphide in fuel oil can present a severe risk to employee safety and operational infrastructure, causing dangerous, corrosive, and potentially lethal concentrations in the headspace areas of storage tanks and bunker fuel cargo.

Measuring hydrogen sulphide content in residual bunker fuel oil assists in establishing the potential a bunker fuel has for forming serious corrosion to ship engines and on-board fuel storage systems, these problems can result in expensive repairs and ship engine failures.



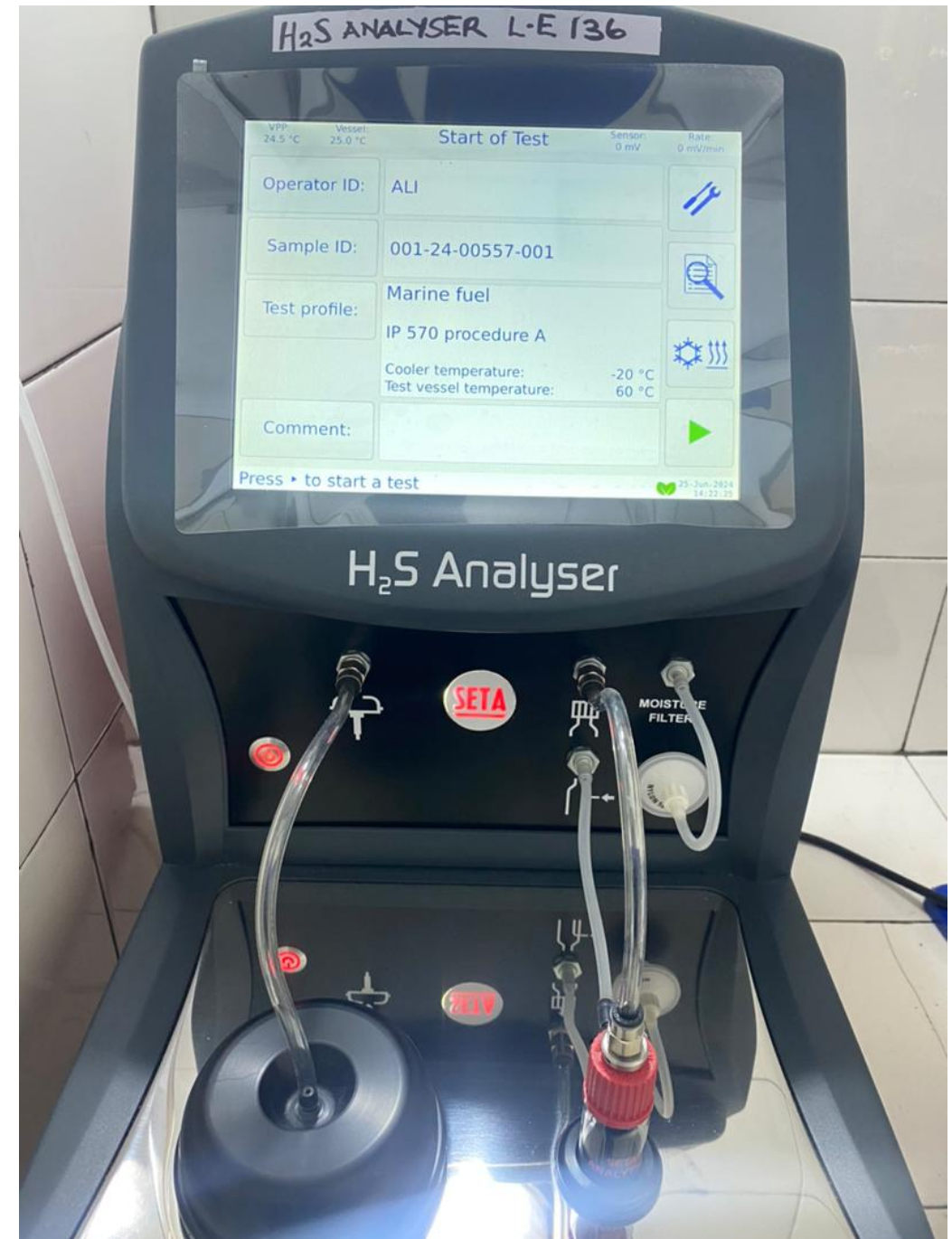
Hydrogen sulphide in bunker fuel also causes a corrosion and safety hazard to refiners, blenders, land-based bulk fuel storage tanks, and fuel pipelines.

Measuring hydrogen sulphide concentration is critical, as marine bunker fuel cargo may produce dangerous levels of H₂S in the vapor space during transportation. H₂S gas can develop from stored bunker fuel due to a number of factors, including higher storage temperatures, biological and chemical decomposition, agitated movement, and extended storage time.



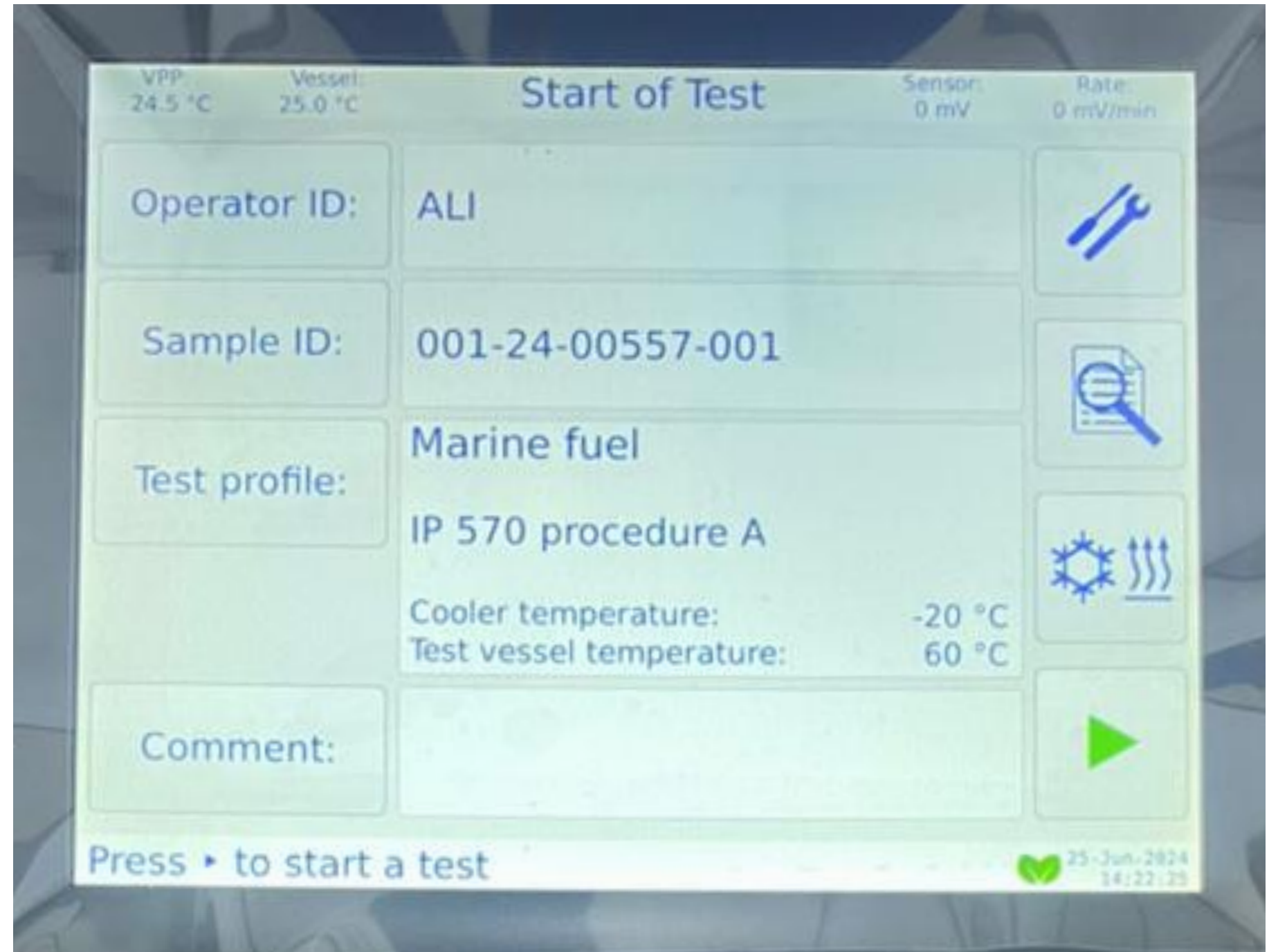
How does it work?

Hydrogen sulphide content by IP 570 involves weighing a test portion which is introduced into a heated test vessel containing diluent base oil. Air is then bubbled through the diluent base oil to extract the H₂S gas. The air, containing the H₂S is passed, via a filter cartridge (procedure A) which is held at -20°C to a detector to enable the H₂S content of the air to be measured and the amount of H₂S in the liquid phase to be calculated.



Potential Issues and Solutions

Some samples can give elevated hydrogen sulphide readings, when measured by procedure B, if they contain interfering compounds such as thiols or alkyl sulphides with a concentration above ~ 5 mg/kg. To eliminate the risk of elevated H₂S readings, the use of a filter cartridge is implemented (procedure A).





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