

Water by Distillation



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What is Water by Distillation

Water by distillation following ASTM D95 is a measure of the volume of water in the range from 0% to 25% in petroleum products, tars, and other bituminous materials by the distillation method.



Why do we test Water by Distillation

A knowledge of the water content of petroleum products is important for maintaining the quality control, refining, purchase, sale, and transfer of products. Understanding the water content in petroleum products enables clients to take steps to minimise risks from corrosion, safety problems, and infrastructure damage which may result from unwanted water content levels.

The amount of water as determined by ASTM D95 (to the nearest 0.05 % or 0.1 % by volume, depending on the trap size used) may be used to correct the volume involved in the custody transfer of petroleum products and bituminous materials.

The permissible amount of water may be specified in contracts.



How does it work?

Water by distillation is determined by heating the material to be tested under reflux with a water-immiscible solvent, which co-distills with the water in the sample. Condensed solvent and water are continuously separated in a trap, the water settling in the graduated section of the trap and the solvent returning to the still. When the evolution of water is complete, the trap and its contents are cooled to room temperature & any drops of water adhering to the sides of the trap are dislodged with a glass or polytetrafluoroethylene (PTFE) rod and transferred to the water layer. The volume of the water in the trap is read to the nearest scale division. A solvent blank shall also be established to ensure any water in the solvent is considered and is subtracted from the volume of water in the trap.



Potential Issues and Solutions

Erroneous results may be caused by vapour leaks, too rapid boiling, inaccuracies in calibration of the trap, or ingress of extraneous moisture. These issues can be eliminated by performing the following verifications:

- ➔ The accuracy of the graduation marks on the trap shall be certified or verified, using only national or international standards traceable equipment.
- ➔ The entire glassware assembly shall be verified prior to first use and at a regular frequency thereafter. The assembly of the apparatus is satisfactory only if the trap readings are within the tolerances specified in ASTM D95.





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