Determination of the flash point
Pensky-Martens method with closed crucible

The flash point is a parameter that is used for classification as combustible, ignitable or flammable in transport, storage, handling and other safety regulations. Exact definitions of the corresponding hazard categories and degrees of hazard can be found in the respective ordinances.

The flash point value may indicate the presence of volatile components in comparatively volatile or non-combustible products. The flash point determination can thus be a first step in the analysis of the composition of unknown products. Flash point determinations should not be performed on potentially unstable products, on products susceptible to decomposition and on explosives unless it has been determined beforehand that they will not decompose, explode or other negative consequences are to be expected if the required quantity of such product is heated in contact with the metallic parts of the flash point test equipment to the temperature range necessary for the determination procedure.

Scope

This International standard describes two methods, A and B, to determine the flash point of flammable liquids, of liquids containing suspended solids, of liquids which tend to form a surface film under the test conditions and of other liquids using the Pensky-Martens closed crucible test apparatus. It applies to liquids that have a flash point above 40 °C.

Procedure A is used to determine the flash point of: Coating materials which do not form a surface film, unused lubricating oils and other petroleum products not covered by method B.

Method B is used to determine the flash point of: Residual fuel oils, blended bitumens, used lubricating oils, liquids that tend to form a surface film, liquids containing suspended solids, and highly viscous liquid products such as polymer-containing liquid products and adhesives.

This International standard cannot be applied to water-based paints and liquids containing traces of volatile substances.

Brief description

The sample is filled into the crucible of the Pensky-Martens testing device and heated in such a way that a constant temperature rise is achieved while stirring. An ignition source is lowered at regular temperature intervals through an opening in the crucible lid, at the same time interrupting stirring. The lowest temperature at which the ignition source ignites the vapour phase above the sample and a flame spreads over the surface of the liquid is recorded as the flash point at the current air pressure. This temperature is corrected to the standard air pressure by means of an equation.

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