

## Overview: Testing of hydraulic fluids / mineral oils

Requirements for pressure fluids according to DIN EN ISO 12922 (also DIN 51502); Distinction between:

<b>HFAE<sup>1</sup></b>	Oil-in-water emulsion (min. 95% water)
<b>HFAS<sup>1</sup></b>	Chemical solutions in water (min. 95% water)
<b>HFB<sup>2</sup></b>	Water-in-oil emulsions with usual water content of at least 40%
<b>HFC<sup>2</sup></b>	Aqueous polymer solution with a usual water content of more than 35%.
<b>HFDR<sup>2</sup></b>	Anhydrous, synthetic liquid based on phosphoric acid esters
<b>HFDU<sup>2</sup></b>	Anhydrous, synthetic liquid based on substances other than HFDR
<b><sup>1</sup> In general incombustible, due to high water content</b>	
<b><sup>2</sup> Performance test for low flammability prescribed (following procedures)</b>	

### 1. DIN EN ISO 15029-1

- Determination of ignition characteristics of spray jets of low flammability liquids - Part 1: Afterburning time of spray jet with flame - Hollow cone method
- Liquid is heated to a defined temperature and sprayed under defined pressure in a prescribed oil burner nozzle as a hollow cone jet [3 litres required].
- With the aid of an acetylene oxygen flame, an attempt is made to ignite at various points of the liquid jet.
- Time from removal of the pilot flame to extinction of the spray jet is measured.
- Requirement: max. afterburning time (at any point) is 30 s

### 2. DIN EN ISO 15029-2

- -Determination of ignition characteristics of spray jets of low flammability liquids Part 2: Spray jet ignition test - Heat release of a stabilized flame [5 litres required].
- -A spray jet consisting of compressed air and pressurized liquid is exposed to a defined gas flame (2 formats possible) in a chamber through which air flows.
- Smoke density, flame length and heat emission ("flammability index") are determined; from this a classification of the low flammability of the liquid is made.

### 3. DIN EN ISO 14935

- Determination of the afterburning time of flame-retardant liquids on a wick
- A piece of non-flammable aluminium silicate tape is soaked with liquid and then placed in a liquid container so that one edge protrudes and forms a wick [1 litre required].
- Small pilot flame touches the edge for 5 different exposure times; afterburning time is measured
- Assessment criterion is the highest mean value of an exposure time; requirement: < 60 s

### 4. DIN EN ISO 20823

- Determination of flammability characteristics of liquids in contact with hot surfaces [1 litre required].
- 10 ml liquid drops from defined height onto a heated steel tube (400°C-700°C depending on liquid type)
- Assessment whether ignition on the pipe and/or in the collection basin
- Assessment: Classification into categories [I(T), I(D), N]

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