chemtronic
Waltemode GmbH

Process measurement of liquids

- Turbidity
- Colour
- Oil in Water
- Water in Oil
- Oil on Water

UV- stimulated fluorescence Model FLUORImat

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General

When working with oil, there is always a risk of leakage.

The Water Resources Act obliges everyone to. "to exercise the care required by the circumstances to prevent contamination of the water". Plants where there is a risk of oil leaking oil into water, in the event of operational malfunctions require continuous metrological monitoring.
When water is discharged into production plants, public waters or drinking water production, even the smallest amounts of oil must be detected. Continuous measurement helps to be able to react immediately to oil leakages.

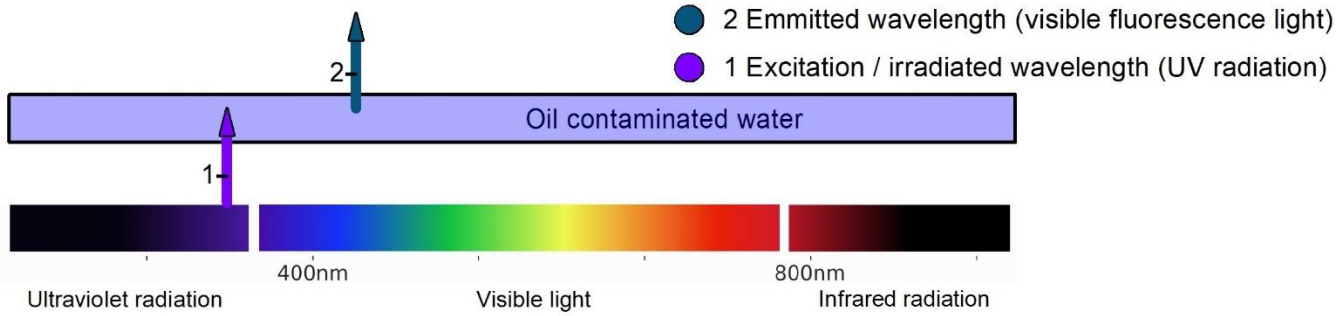
What does UV- stimulated Fluorescence mean

The property of solid, liquid or gaseous substances after irradiation with
UV light, a part of the absorbed radiation energy is re-emitted at the same or a longer wavelength.
The aromatic components in mineral oil have the property of fluorescing and emitting visible light when illuminated with UV light.

Fluorescence of Mineral Oils

Short-wave UV light is absorbed and converted into long-wave light. If this effect were visible to the eye, one would see that UV light is converted into yellish-green fluorescent light.

Principle of UV- stimulated fluorescence by the example of oil in water



Take Notice

Different oils produce different fluorescence intensities. The intensity of the fluorescence typically depends on the concentration of unsaturated hydrocarbons in the respective oil. A calibration in ppm can therefore only be made for a specific oil.

Model FLUORImat

Used to detect low oil concentrations, partially invisible to the human eye.
In addition to fluorescence, UV transmission is also taken into account. UV- transmission is the portion of UV radiation that passes through the sample at an unchanged wavelength. The transmission decreases with increasing turbidity respectively oil content, the intensity of the fluorescence increases proportionally to the oil content.
The signals from fluorescence and UV- transmission are combined by the electronics. The quotient of the two signals forms the measurement result. This signal combination compensates for fluctuations in UV intensity, turbidity influences and soiling of the measuring windows.

Setup of the Model FLUORImat

Fluoreszenz	(90°)	Die Detektoroptik ist im rechten Winkel (90°) zum Lichtstrahl angeordnet
UV- Transmission	(180°)	Die Detektoroptik ist direkt gegenüber der UV-Quelle angeordnet

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Typical Measuring Ranges

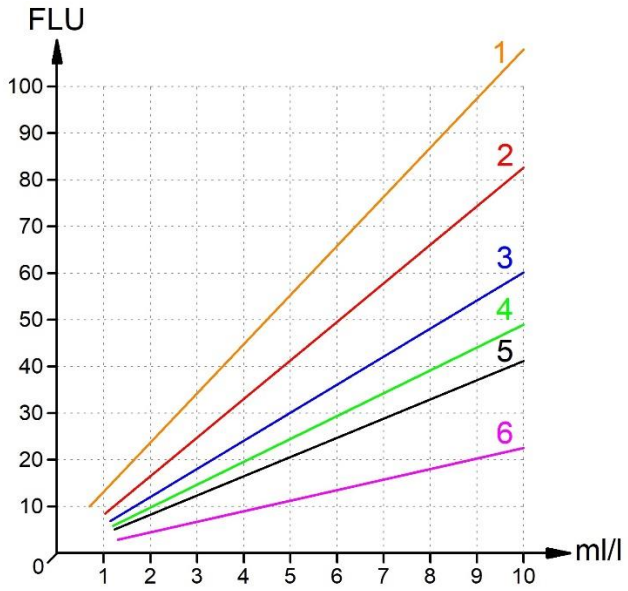
Fluorescence meters are designed to detect low oil concentrations in a range of about 0-100ppm. The resolution of these systems is in the range of 0.1ppm. The upper measuring range is in the optimal case below 300 ppm, but depending on the system used, measuring ranges of over 1000ppm can also be realized.

Typical Measuring Units

ppm:	**P**arts **p**er **m**illion
mg/l:	Milligram per Liter
ml/l	**Mi**lli**l**iter/**L**iter
FLU:	**Fl**uorescence **U**nit*

*The factory calibration is typically performed with quinine sulfate, independent of oil.
1 ppm quinine sulfate corresponds to a fluorescence light intensity of 1FLU (fluorescence unit).
Alternatively, the instrument can be calibrated with a user-supplied type of oil in the desired unit of measurement.

Fluorescence of different oils compared with the fluorescence unit (FLU)



1 Hydrauliköl / Hydraulic oil
2 Getriebeöl / Gearbox oil
3 Wärmetauscher Öl / Heat exchanger oil
4 Rohöl / Crude oil
5 Schweres Heizöl / Heavy heating oil
6 Diesel / Diesel fuel

Principle Model FLUORImat