

Ultraviolet Technology

UV Disinfection in the Oil Industry

How Does Ultraviolet Work?

Ultraviolet energy causes permanent inactivation of micro-organisms by disrupting DNA so that they are no longer able to maintain metabolism or reproduce.

The maximum effectiveness occurs at between 240nm and 280nm, with the most effective wavelength typically at 265nm. The Hanovia Arc Tube produces these wavelengths in abundance.

All bacteria, spores, viruses and protoza are permanently inactivated by UV.

Where is UV used?

UV is widely used throughout industry to provide high quality microbially controlled water for manufacturing and human consumption.

In the oil industry there are two major uses for UV technology:

- ▶ Platform services-water for drinking, showers etc., on-board, off shore accommodation platforms.
- ▶ Well injection water-water injected into the rock formation around the well in order to:
 - Avoid reservoir compaction and sea bed
 - Increase oil recovery

80-90% of oil fields eventually use water injection.

Injection Water Treatment

Generally treated seawater is used - treatment stages as follows:

- ▶ Filtration - 98% of particles less than 2 micron are removed
- ▶ Primary disinfection - to control general aerobic bacteria (GAB) and sulphate reducing bacteria (SRB). These can lead to pore throat blockage in rock strata, well souring and corrosion.
- ▶ De-aeration- to remove oxygen needed by GAB to metabolise. The presence of oxygen will also cause corrosion of structures.
- ▶ Biocide - usually shot dosed to reach into the rock strata and eliminate contamination sources from within the well.

