

HYDROCARBONS IN COOLING TOWER WATER

Leaks of hydrocarbons from heat exchangers can emit large quantities of volatile organic compounds (VOCs). This can be a hazard from a flammability standpoint as well as cause emissions to the atmosphere. 99.0 to 100% of VOCs are stripped to the atmosphere in cooling towers and have been found to be 12,576 pounds per day from a single exchanger. On-line continuous monitoring can pay for an analyzer in a short time by immediate warning of corrosion leaks and resulting corrective action to eliminate possible compliance fines. Savings in lost product and laboratory time can be substantial.

HYDROCARBONS IN COOLING WATER

Chemical:	SATURATION IN WATER PPMw:	HEADSPACE CONCENTRATION % AT SATURATION:	LOWER EXPLOSIVE LIMIT IN % IN AIR:	PPMw IN WATER FOR LOWER EXPLOSION LIMIT IN HEADSPACE:
BENZENE	700	11.1	1.35	85
PROPYLENE	762	100	2.00	15
HEXANE	140	19.7	1.25	9
PROPANE	120	100	2.2	2.6
ETHYLENE	276	100	3.1	8.6
METHANE	2.68	100	5	0.13

Fortunately, airflow through a cooling tower dilutes the hydrocarbon allowing higher concentrations than shown on the right column before the cooling tower reaches hazardous levels.

A typical cooling tower with 10 PPM by weight hydrocarbon content will emit 15,000 lbs/day lost product. At 1,500 million lbs/day flow rate.

Gallons per day cooling tower flow x PPMw x 0.000,001 x 8.337 lbs/gal = lbs/day product lost.