

# Ultraviolet Technology

## UV In Pesticide Reduction

### How Does Ultraviolet Work

Ultraviolet light produces high-energy photons, which break molecular bonds in organic molecules. UV also produces OH-radicals, which drive photon-oxidation processes, further assisting breakdown. The maximum effectiveness depends on the particular pesticides present, so a broad spectrum of wavelengths is required to deal with all types, particularly if the loading varies over time. Such a spectrum of appropriate UV wavelengths is produced in abundance by the Hanovia medium pressure Arc Tube. Absorption media such as carbon are not required with Hanovia UV.

### Pesticide Control in Drinking Water

Pesticides are widespread in the environment and vulnerable aquifers (particularly chalk) and surface sources are often contaminated. The EC has set a maximum of 0.1 and 0.5 g/l respectively and water sources may carry 2-5 times these levels. Meeting the EC requirements can be achieved by UV photon-oxidation using Hanovia's high-energy system.

UV is also a powerful disinfectant, which works by inactivating the DNA of microorganisms and preventing growth; it is already widely used to ensure a safe supply of drinking water. Then UV is used to remove pesticides, it has the powerful and beneficial side effect of ensuring microbiological safety.

### Hanovia's Role In the Control of Pesticides

Hanovia, the world leader in UV technology for water disinfection over the last 75 years, has now developed and optimised UV treatment systems to reduce pesticide contamination in water. Hanovia is the only UV supplier which manufactures both the UV equipment and the special Arc Tubes, which research has shown to generate the required energy levels across the appropriate wavelengths.



*32 Chambers at Boxalls Lane, Southeast Water, England*

## Why UV is used in Pesticide Control

### **Most Efficient**

- ▶ All pesticides are broken down with UV at the appropriate dose
- ▶ Treatment is effectively monitored
- ▶ Permanent accurate treatment records are produced
- ▶ UV is the most cost-effective method of pesticide removal
- ▶ Easy to use intermittently when seasonal variation requires
- ▶ Disinfection is also achieved with UV
- ▶ System is flexible

### **Superior to Alternatives**

- ▶ In-line treatment
- ▶ No absorption media required
- ▶ No contact tanks required

### **No Detrimental Effects**

- ▶ UV has no effect on pH and produces no taints

### **Safety**

- ▶ No hazardous chemicals required

## Hanovia UV systems

### **Compact and easy to install**

- ▶ Conveniently fit into existing pipework in most process areas
- ▶ Minimum site preparation
- ▶ Pre-assembled units available pre-wired and skid-mounted, requiring only connection to electrical supply
- ▶ Can interface with most computer-controlled continuous and catch processes
- ▶ Full suite of telemetry outputs available

### **Rigorous Quality Control**

- ▶ All Hanovia 316L stainless steel chamber, quartz Thimbles and Arc Tubes are built to the highest possible standards
- ▶ Every Arc Tube is individually checked and each completed system tested and run before despatch
- ▶ Test certificates always supplied

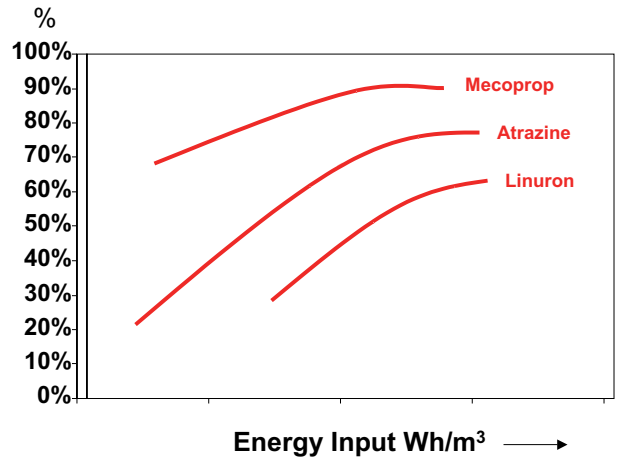
### **All Hanovia system Include**

- ▶ Treatment Chamber
- ▶ High Intensity Photolytic Arc Tube
- ▶ UV Monitor (wavelength specific)
- ▶ Constant Wattage Transformer
- ▶ Control Unit
- ▶ Power Supply Cabinet

## Why UV is Used in Pesticide Control

The amount of UV required for Pesticide reduction will depend on:

- ▶ The source and quality of the water
- ▶ The type of pesticides present
- ▶ The reduction required
- ▶ The flow to be treated



*Typical Reductions Achieved*

As each of the raw water and performance requirements is different, Hanovia can supply equipment for trial or pilot work. For further information contact a Hanovia specialist who will be pleased to advise and assist you.



Ref: The Degradation of Atrazine and other Pesticides by Photolysis. The Journal of Chartered Institution of Water and Environment Management, Vol.9, August 1995, Bourguine et al. Copies available on request from Hanovia

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