

# Ultraviolet Technology

## UV Disinfection of Sugar Syrup

### 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 protozoa (including Cryptosporidium and Giardia oocysts) are permanently inactivated by UV.

### Why is UV treatment required for Syrup?

Concentrated Syrups, typically at 25 to 67 Brix, have a high osmotic pressure. This prevents micro-organisms growing and reproducing, however they will survive in spore form and will grow once the syrup is diluted into the food product or beverage. Microbial growth in foods and beverages can cause food discolouration, off flavours and shorten shelf life. Threat of contamination has been further increased as manufacturers respond to consumer demand for reduction in chemical additives and preservatives.

Manufacturing specifications are demanding and the use of UV ensures that they can be comfortably achieved, without the complexity and expense of plate heat exchangers. A high output single Arc Tube provides a powerful, yet controllable disinfection force.



#### Most Efficient

- ▶ No micro-organisms survive UV disinfection
- ▶ Treatment is effectively monitored
- ▶ Permanent accurate treatment records are produced, so all batches can be traced. Ideal for ISO9000, BS5750 etc.
- ▶ In-line treatment
- ▶ UV is the most cost effective method of syrup disinfection

#### Superior to Alternatives

- ▶ Pasteurisation is expensive in capital equipment and running costs
- ▶ Sterile filtration does not remove all spores from syrup

#### No Detrimental Effects

- ▶ UV has no effect on pH, colour, flavour and aroma
- ▶ UV has no detrimental effect on product stability

#### Safety

- ▶ No steam or hot water required

## Applications

### **Liquid Syrup In-line**

The Hanovia UV-S 2.5kW, 3.5kW and 5kW chambers are designed to eliminate organisms which are responsible for taste and flavour problems in sugar solutions. Each chamber contains a single high intensity Arc Tube, which emits a powerful germicidal dose of UV. A monitor constantly checks the UV intensity. This system is installed in-line after the storage tank discharge point, so the syrup is treated prior to dilution into the food or beverage.

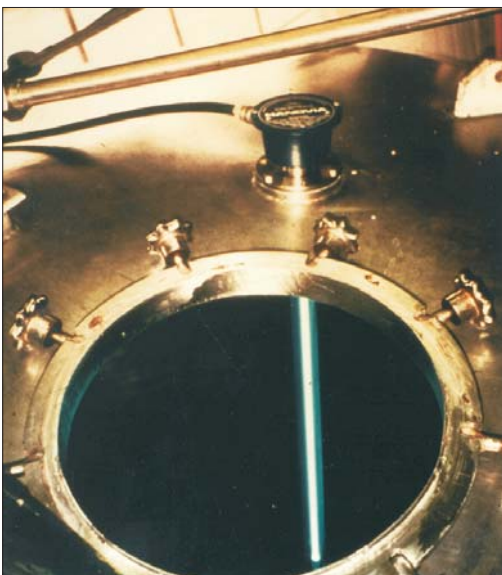
The syrup is treated prior to the addition of additives, flavourings or colourants, all of which reduce UV Transmission.



Hanovia UVS Sugar Syrup System

### **Tank Headspace**

Modern hot dissolving systems can leave the headspace above the syrup as an ideal growing environment for spoilage organisms. Condensation containing spores and even growing cultures, can drip off the inner wall of the vessel leading to surface growth and infection of the syrup. The Hanovia UVI product range is designed to overcome this problem. The UVI works in the headspace to prevent airborne contamination, it can be fully immersed in the syrup when the vessel is filled to capacity.



Hanovia UV-I System for disinfection of tank headspace

## Hanovia UV Systems

Compact and Easy to install

- ▶ Hanovia UV systems 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
- ▶ Silent operation
- ▶ Can interface with most computer controlled continuous and batch processes

Inexpensive and Simple to Maintain

- ▶ Simple and safe operation easily understood by operators
- ▶ Designed for remote operation
- ▶ Replacement of Arc Tubes is quick and simple

Rigorous Quality Control ISO 9001

- ▶ All Hanovia stainless steel chambers and Arc Tubes 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 Disinfection Systems Include:

- ▶ Disinfection Chamber
- ▶ Arc Tube
- ▶ Control / Power Supply Cabinet
- ▶ UV Monitor

## Why is Hanovia the Leading UV Supplier?

- ▶ Hanovia has pioneered the use of UV in various applications for over 75 years
- ▶ Hanovia manufactures its own stainless steel chambers, quartz sleeves and arc tubes to the highest possible standards
- ▶ Hanovia is the only system manufacturer which also makes Arc Tubes
- ▶ Hanovia has a world-wide network of distributors who stock a complete range of spares





UV Dose for Sugar and Syrup

The UV dose required for the plant should be decided in conjunction with a Hanovia specialist, who will also advise on installation.

# Hanovia

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