



## **Hallett™13 and Hallett™ 30 UV Systems Technology Fact Sheet for UV Pure Technologies Inc.**

### **Performance Claim**

The Hallett™ UV systems provide microbiological purification of drinking water through their Crossfire Technology™ and disinfect water for pathogens including viruses, bacteria such as *E. coli*, and parasitic cysts such as *Cryptosporidium*, *Giardia*. The verified performance claims are:

- (1) The Hallett™30 and the Hallett™ 13 are certified,
  - per NSF/ANSI Standard 55 to conform to Disinfection Performance Class A, at flow rates of 30 US GPM and 13.3 US GPM respectively
  - per NSF/ANSI Standard 55 Material Extraction w/o Media; *STATUS*: PASS
- (2) The Hallett™ 30 and the Hallett™ 13, operated at flow rates of 30 US GPM and 10 US GPM respectively, produce a minimum UV dose of 40 mJ/cm<sup>2</sup> at the end of lamp life, with 95% confidence
- (3) The Hallett™ 13 UV system, when tested in a cold air and cold water environment at normal flow rate maintains an average UV output within 1.5% for 20°C air temperature and 1°C water temperature; and maintains an average UV output within 4.5% for 1°C air temperature and 1°C water temperature, with 95% confidence
- (4) The Hallett™ 30 and the Hallett™ 13 systems were tested according to requirements of the Province of Quebec, Environment Ministry “Evaluation Technique du Comité sur les Technologies de Traitement en Eau Potable” and were granted the classification “Niveau de développement: Éprouvé” (PROVEN)

### **Technology Application**

The following water conditions are acceptable for application of Hallett™ UV systems:

- hardness: 0-855 mg/L
- iron: 0-3 mg/L
- manganese: 0-0.5 mg/L
- UV transmittance: 75-100%
- pH: 6.00-9.00
- total dissolved solids (TDS): 0-1000 mg/L
- water temperature: 1-38 °C
- air temperature: 7-38 °C
- turbidity: 0.00-1.00 NTU
- water pressure: 10-100 psi (69-690 kPa)

Hallett™ UV systems must be positioned vertically on a wall and should be installed downstream of any pre-treatment devices such as filters, water softeners, etc. and also any pressure tanks. Pre-filtration to remove 5-micron sediment is recommended.

### **Performance Conditions**

Microbial challenge trials were conducted by NSF International. In these trials, MS2 coliphage, a challenge organism, was passed through the Hallett™ 13 and Hallett™ 30 UV systems and the log reduction of the MS2 was recorded. Microbial challenges were conducted at 30 US GPM for the Hallett™ 30 UV system and at 10 US GPM for the Hallett™ 13 UV system. At GAP Microbial Services a Hallett™ 13 reactor was tested by measuring UV Intensity output in cold air (as low as 1°C) and cold water (1°C) and compared to room temperature air and water of 20°C. UV Intensity measurements were made via voltage output from an UV sensor. In the Province of Quebec, several installed Hallett™ 13 and Hallett™ 30 systems were reviewed after an extended period of performance.



## Technology Description

The Hallett™ UV systems aim to provide microbiological purification of drinking water through application of ultraviolet (UV) light. The Hallett™ UV systems' patented Crossfire Technology™ is designed with the water column inside a quartz tube, and two UV lamps, which are in air surrounded by elliptical reflectors. The following are the Hallett™ UV systems specifications:

<b>Multiple System Flow Capacity</b>	Run in parallel – Hallett™ 30 systems can treat up to 600 USGPM
<b>UV Dose</b>	Hallett™ 13 – 65 mJ/cm <sup>2</sup> at end of lamp life Hallett™ 30 – 40 mJ/cm <sup>2</sup> at end of lamp life
<b>Built-in microprocessor</b>	Dual smart sensors monitor UV output and water quality (UV transmittance)
<b>Alarms</b>	Visual and audible notification of: system is working and water is safe; lamp output alarm; water quality alarm
<b>Monitoring</b>	Continuous UV transmittance feedback
<b>Solenoid valve</b>	Auto shut-off fail-safe valve
<b>Self-cleaning</b>	Stainless steel wiper prevents quartz fouling
<b>Maintenance</b>	Automatic alarm reminder – lamp replacement every 12 months
<b>Pre-filtration</b>	5 micron sediment filter recommended and/or carbon filter for taste and odour
<b>Maximum pressure</b>	100 psi (690 kPa)
<b>Pressure drop</b>	Hallett™ 13 – 4 psi at 7 GPM (27 kPa at 26 L/min) Hallett™ 30 – 20 psi at 22 GPM (138 kPa at 83 L/min)
<b>Voltage</b>	Hallett™ 13 – 120/220 VAC – 100 W Hallett™ 30 – 120/220 VAC – 140 W
<b>Electrical</b>	Entela (UL and CSA equivalent)
<b>Dimensions</b>	Hallett™ 13 – 24" H x 8" W x 9" D Hallett™ 30 – 32" H x 8" W x 9" D

## Verification

NSF/ANSI 55 test reports were submitted in support of the first performance claim. Documents from GAP EnviroMicrobial Services were submitted in support of the second performance claim. The Province of Quebec approval document was submitted in support of the third performance claim. The verification was completed by Andrews, Hofmann and Associates Ltd. using ETV Canada's General Verification Protocol (March, 2000).

## What is the ETV Program?

The Environmental Technology Verification (ETV) Program is a joint Environment Canada - Industry Canada initiative delivered by ETV Canada. The ETV Program is designed to support Canada's environment industry by providing credible and independent verification of technology performance claims.

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