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Underwriters Laboratory conducted the following tests on Gateway's Sidewinder™ sprinkler drops.

**1. HYDRO STATIC STRENGTH TEST**

*Gateway's Sidewinder™ passed.*

**2. LEAKAGE TEST**

*Gateway's Sidewinder™ passed.*

**3. MECHANICAL STRENGTH TEST**

*Gateway's Sidewinder™ passed.*

**4. VIBRATION TEST**

*Gateway's Sidewinder™ passed.*

**5. SALT SPRAY CORROSION TEST**

*Gateway's Sidewinder™ passed.*

**6. PRESSURE CYCLING TEST**

*Gateway's Sidewinder™ passed.*

**7. BENDING TEST**

*Gateway's Sidewinder™ passed.*

**8. FREEZING TEST**

*Gateway's Sidewinder™ passed.*

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## 1. HYDRO STATIC STRENGTH

### Method

Samples of Gateway's Sidewinder™ were mounted in the position as indicated in the following table and were subjected to a hydrostatic pressure of 875 psig (62 kg/cm<sup>2</sup>) and held for 1 minute.

Table 1

<u>Sample #</u>	<u>Length</u>	<u>Position</u>
1	Minimum	Straight and Unrestrained
2	Minimum	Restrained to Minimum Bend Radius (3 in.)
3	Maximum	Straight and Unrestrained
4	Maximum	Restrained to Minimum Bend Radius (3 in.)

### Results

*There was no evidence of distortion, leakage, rupture or permanent change in length for all samples tested.*

## 2. LEAKAGE

### Method

Samples of Gateway's Sidewinder™ were mounted in the positions as indicated in Table 1 and were subjected to a hydrostatic pressure of 350 psig (25 kg/cm<sup>2</sup>) and held for 1 min.

### Results

*There was no evidence of leakage for all samples tested.*

## 3. MECHANICAL STRENGTH

### Method

A torque of 60 ft-lb (624 kg-cm) was applied to the outlet of a Sidewinder™ and held for 10 s. Following the torque application, the sample was examined and then subjected to a hydrostatic pressure of 175 psig (12.3 kg/cm<sup>2</sup>) for 1 min and examined for leakage.

### Results

*The sample withstood the torque application without deformation, fracture or leakage.*

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## 4. VIBRATION

### Method

Two samples of Gateway's Sidewinder™, the longest length utilizing the minimum bend radius and the shortest length utilizing the minimum bend radius, were subjected to a hydrostatic pressure of 500 psig (35.1 kg/cm) for 1 min. The Sidewinder™ drops were filled with water, mounted in the pendent position of a test fixture attached to a vibration table, pressurized with air to 175 psig (12.3 kg/cm<sup>2</sup>), and vibrated in each axis as specified in the following table:

<u>Axis</u>	<u>Amplitude, in.</u>	<u>Frequency (Variable), Hz</u>	<u>Time, h</u>
Horizontal	0.04	18 to 37	60
Vertical	0.04	18 to 37	60

Following each mode of vibration, the Hydrostatic Pressure Test was repeated at a pressure of 500 psig (35.1 kg/cm<sup>2</sup>).

### Results

*The samples showed no evidence of leakage, distortion or permanent change in length.*

## 5. SALT SPRAY CORROSION

### Method

A sample Sidewinder™ assembly was exposed to a 20 percent salt spray (NaCl) for a period of 10 days. Upon removal from the environment the sample assembly was subjected to a hydrostatic pressure of 875 psig (62 kg/cm<sup>2</sup>) for 1 min.

### Results

*Sample assembly did not exhibit any signs of incipient corrosion, distortion, leakage or permanent change in length.*

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## 6. PRESSURE CYCLING IN ACCORDANCE WITH UL 199

### Method

Four samples of Gateway's Sidewinder™, (1) maximum length, unrestrained; (2) maximum length, minimum bend radius; (3) minimum length, unrestrained; (4) minimum length, minimum bend radius were connected to a hydrostatic pressure source consisting of a piston-type pump adjusted to rapidly subject the adjustable drop nipple to **3000 pressure surges**, which are varied sinusoidally with time at a frequency of 60 c/min., from 0 to 50 to 0 psig (0 to 3.52 to 0 kgf/cm<sup>2</sup>) and examined for leakage. The same samples were then subjected to **3000 pressure surges**, at the same frequency, from 0 to 500 to 0 psig (0 to 35.21 to 0 kgf/cm<sup>2</sup>) and examined for leakage. The same samples were then subjected to **3000 pressure surges**, at the same frequency, from 0 to 50 to 0 psig (0 to 3.52 to 0 kgf/cm<sup>2</sup>) and examined for leakage.

### Results

*The sample assembly did not exhibit any signs of leakage, distortion or permanent change in length.*

## 7. BENDING IN ACCORDANCE WITH UL 213

### Method

The flexible tube component of the Sidewinder™ assembly was subjected to a 10 c of bending from the straight position to the point of the minimum bend radius of 2 in. (50 mm) as specified by the manufacturer. Leakage and Hydrostatic Tests were performed upon completion of the 10 c.

### Results

*Sample tube showed no evidence of leakage, distortion or permanent change in length.*

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## **8. FREEZING TEST**

### **Method**

Sample Sidewinder™ drops were individually connected to one end of a 4" long, 1" Schedule 40 pipe. Each pipe was completely filled with water and exposed to an atmosphere of  $20 \pm 10$  °F ( $29 \pm 5$  °C) for 24 hours. The samples were then visually examined. Since no abnormalities were noted, the samples were then tested for leaks at a pressure of 7 psig. Since no leaks were noted, the samples were then subjected to the tests described above under the Hydro Static Strength test.

### **Results**

*There was no evidence of distortion, leakage, rupture or permanent change in length for all samples tested.*