

## Holdrite

### Microbiological Analysis Report

**Project No: 14118-E**

Date Received: 2/11/2019

Date of Analysis: 2/11/2019

**Subject:** Fungal Resistance Testing**Background & Objectives**

One sample was received for fungal resistance testing using the ASTM G21 test method.

**Protocol**

ASTM G21-15, Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi, test was strictly followed.

**Overview of Test Protocol**

This test method is designed for the qualitative determination of mildew (fungus) resistance of synthetic polymeric materials, particularly those types which have been given a fungus resistant treatment.

**Specifics of the Test**

| Lab ID  | Sample ID               |
|---------|-------------------------|
| 14118-E | HydroFlame™ Pipe Collar |

**Test Inoculum**

The fungal inoculum consisted of five species:

*Aspergillus brasiliensis* ATCC 9642

*Chaetomium globosum* ATCC 6205

*Penicillium funiculosum* ATCC 11797

*Trichoderma virens* ATCC 9645

*Aureobasidium pullulans* ATCC 15233

Test samples were placed in petri dishes on nutrient salts agar and inoculated with the test fungi. The samples were incubated at 28°C for 4 weeks and examined weekly for the growth of the test organisms.

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### Evaluation of Results

For the evaluation of the relative resistance of synthetic polymeric materials, the following rating system was used:

| Fungal Growth Rating Legend             |   |
|---|---|
| None                                    | 0 |
| Traces of growth (less than 10%)        | 1 |
| Light growth (10-30%)                   | 2 |
| Medium growth (30-60%)                  | 3 |
| Heavy growth (60% to complete coverage) | 4 |

### **Results**

Table 1 shows the Fungal Resistance Test results.

### **Conclusions**

The Holdrite sample HydroFlame™ Pipe Collar showed fungal resistance after four weeks in the ASTM G21 test. No growth was observed on the samples.

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Microbiologist

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**Table 1. Fungal Resistance of Polymeric Surfaces**

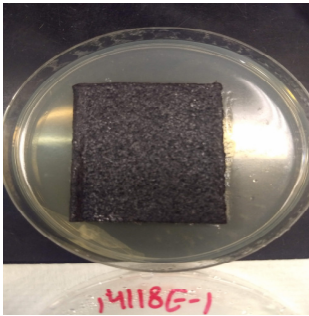
| Lab Identification | Sample                                | Observed Fungal Growth on Treated Surface after 28 days Incubation at 28-30°C |   |   |
|--------------------|---------------------------------------|---|---|---|
|                    |                                       | 1   | 2 | 3 |
| 14118-E            | HydroFlame™ Pipe Collar               | 0   | 0 | 0 |
| PC                 | Growth Control (Whatman filter paper) | 4   |   |   |

| Fungal Growth Rating Legend             |   |
|---|---|
| None                                    | 0 |
| Traces of growth (less than 10%)        | 1 |
| Light growth (10-30%)                   | 2 |
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| Heavy growth (60% to complete coverage) | 4 |

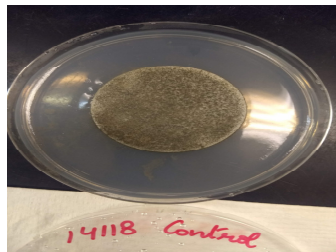
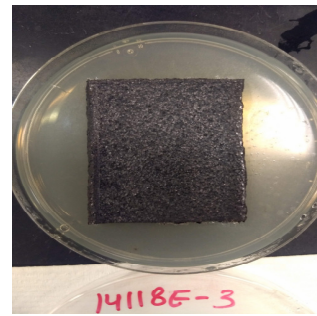
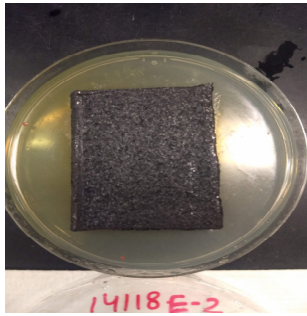
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Photos after 4 weeks of testing:



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Whatman Filter Paper