

Lesson 5: Is mycelium safe?

Objectives:

1. Investigate the Code of Federal Regulations with respect to flammability.
2. Design your own vertical flame test.
3. Collect data and calculate the burn rate of household products and mycelium.



Introduction:

What if we made household products or toys out of mycelium? What characteristics would it need to have to be safe and durable? When products become ‘commercialized’, it means they are being manufactured and sold as profit. If a business is commercializing a new product, they must ensure they are following the U.S. Code of Federal Regulations. This is a huge database of regulations that are constantly improving over the years. It is made to help keep the customer safe from potentially toxic or dangerous products.

Flammability Regulations:

Visit the main page of the Code of Federal Regulations [here](#). A [flammability tester](#) is used in order to determine how flammable, or how likely a material is to catch fire and burn. According to § 1611.3 on Flammability General Requirements,

The rate of burning shall not exceed 1.2 in./sec as judged by the average of five determinations lengthwise and five determinations transverse to the direction of processing, when the material is tested with the SPI flammability tester in accordance with the method described in § 1611.4.

Vertical Flame Test:

Design a simplified version of the flammability apparatus in the lab below.

Materials:

- A soft toy, fabric, or household material that will otherwise be thrown away.
- Safety goggles
- Thermal gloves
- Fume hood or well-ventilated area
- Mycelium composite
- Ring stand
- 2 clamps (ring or burette)
- Candle and matches, or bunsen burner
- Ruler

Procedure:

1. Cut a long rectangular piece from the material.
2. Using a ring stand and clamps, attach the piece to be suspended in a stable and vertical position.
3. In a fume hood, or a well-ventilated space instructed by your instructor, position the flame source just below the rectangular piece. Do not light it yet.
4. Assign a length of time to which you will allow the flame to burn. Anywhere between 30 seconds to a minute is fine.
5. When you are ready with your timer, light your flame source and observe.
6. After the assigned time, remove the flame source, and let your material cool before touching.
7. Once the material is cooled, measure the distance that was burned. Any part of the material that is blackened, charred or melted away is categorized as burned.

8. Repeat steps 2-7 with mycelium composite. You may choose to suspend the whole planter, or use cut mycelium composite provided by your instructor.
9. Record results in a data table such as the one below.

Table 1: Vertical distance (mm) burned by various materials, when exposed to a flame for _____ seconds.		
	Distance burned (mm) in material #1	Distance burned (mm) in material #1
Trial 1		
Trial 2		
Trial 3		
Mean		

Reflect:

- What were the burn rates of your tested products?
- Did either material exceed a burning rate of 1.2 inches/second as indicated by federal regulations? (bear in mind that our apparatus is a much more simplified version and will not yield the exact same results).
- What do these results tell you about the safety of making products out of mycelium composite?