

Composite Fuselage Firefighting Issues

International Aircraft Materials Fire Test Working Group

Naples, FL

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By

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RESEARCH
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Extinguishing Burning Composite

OBJECTIVE:

- Determine the best method and agents to quickly and efficiently extinguish a variety of aircraft composites.

APPROACH:

- Evaluate existing agents (Class A Foam, AFFF, heat absorbing gels) and applications techniques (such as UHP) to identify the most effective method to extinguish fires involving large amounts of composites.
- Use standardized composite samples of carbon/epoxy carbon BMI composites
- Use standard sized fire
- Orient the composites in both horizontal and vertical configurations
- Evaluating the effects of wicking fuel into delaminated composite layers.

Define Test Fire

■ Key Features

- Reproducible
- Cost Effective
- Realistic

■ “Robust” Fire

- Difficult to Suppress
- Susceptible to reignition
- Test of Agents and Application Technologies
- **Not a test of Material!**

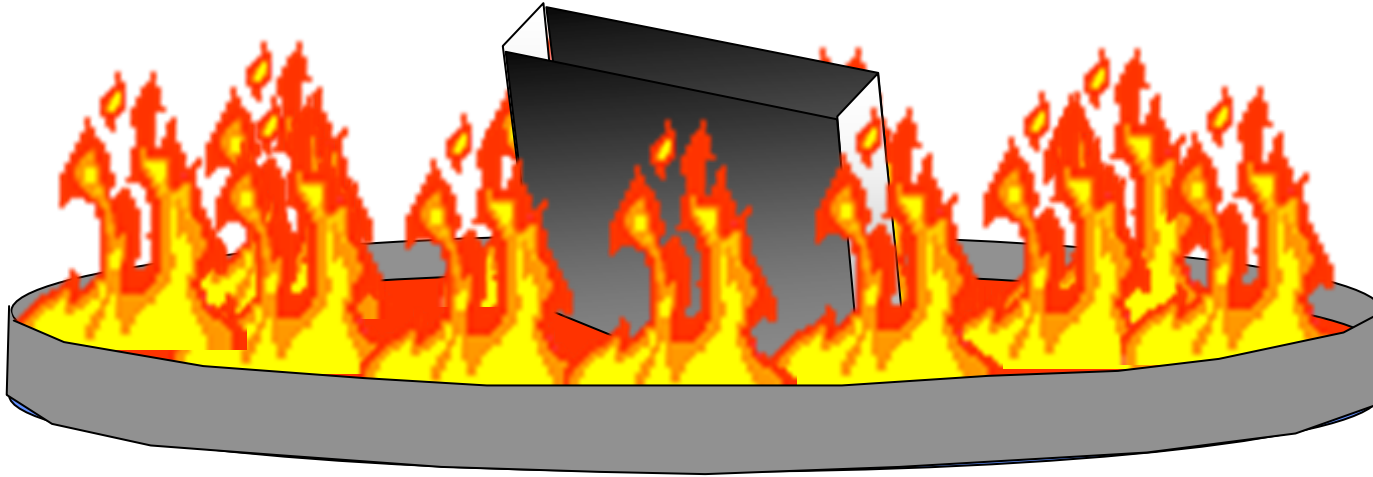
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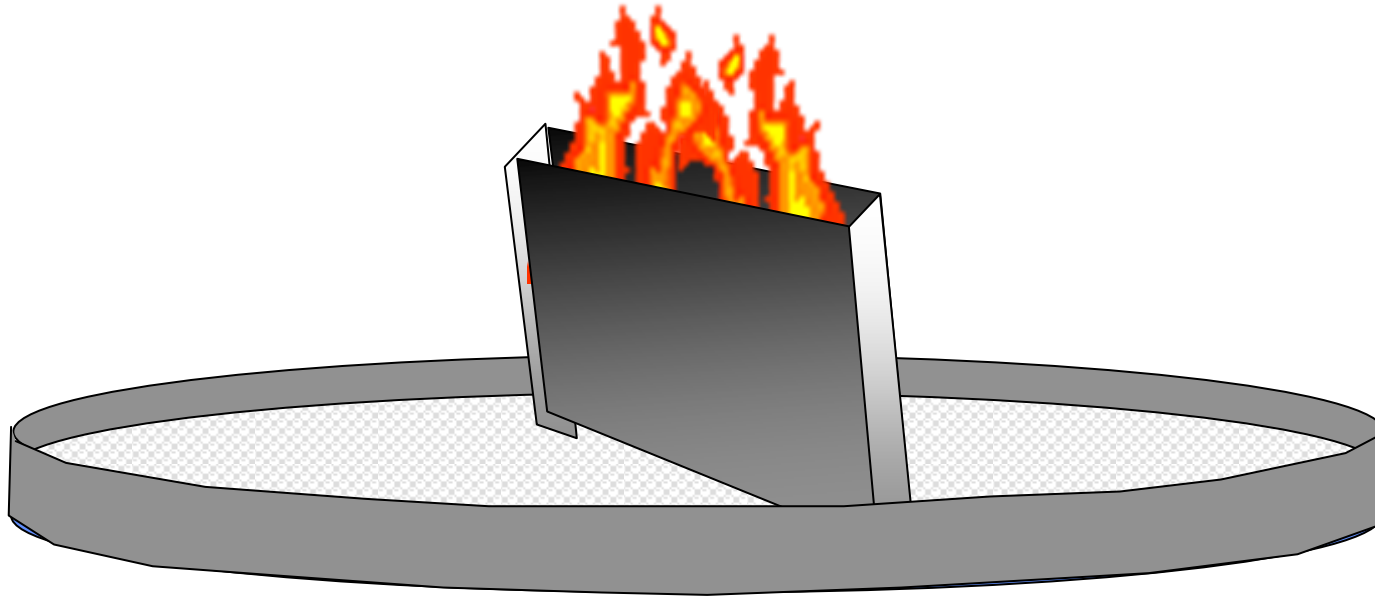
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Pre-Burn



- **Defined by response time**
 - **How soon is the first truck on scene and fighting fires**
 - **Three to Five Minutes**

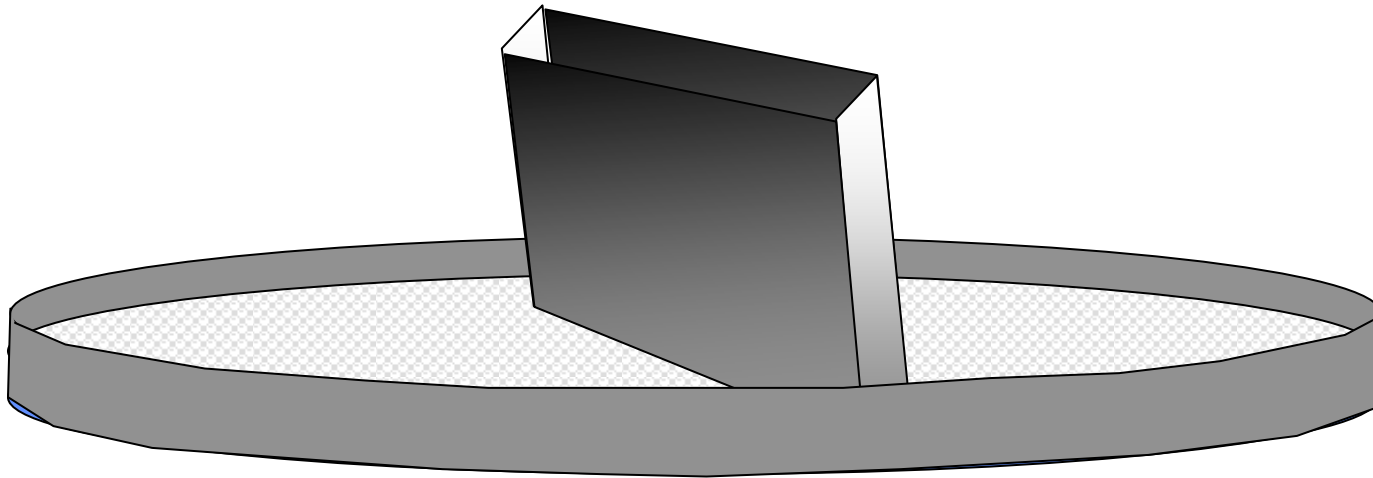
Composite Burn



■ Survivable Crashes

- Rescue Crews must be able to enter aircraft safely
- Interior fires must be extinguished and reignition prevented

Composite Extinguished

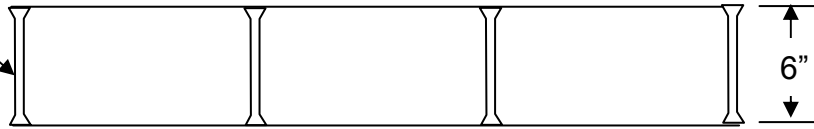


- **Assess Damage to Composite**
 - Residual strength
 - Hazard to rescue crew and disabled passenger

Initial Sample Concept

1/8 - 3/16"

1/2 - 3/4"



3'

2'

- Custom Fabricated Sample
- Simulate Aircraft Component
- Cost estimate \$6,000 to \$7,000 ea @ 100 units

Low Cost Components

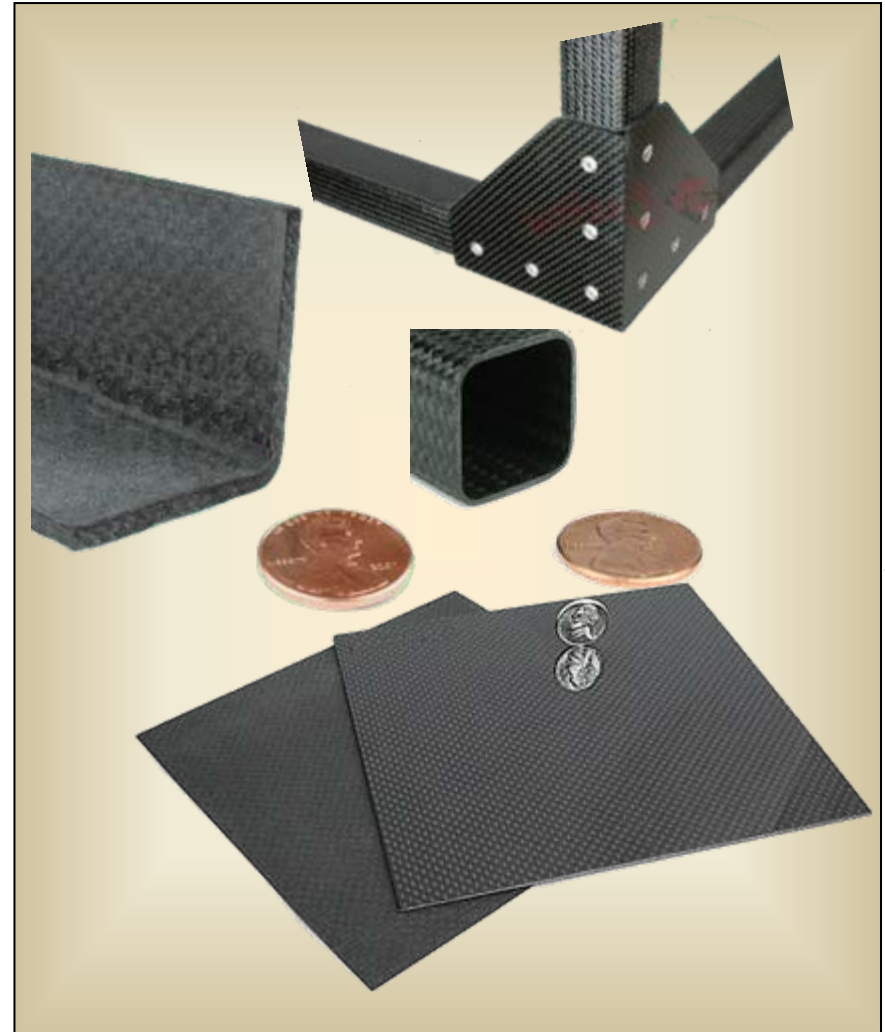
- Sheets, rods, tubes and gussets
- Fabricate Structures
- Control Loading
- Control Shape
- Effect of Adhesive?



Four Point Bend Loading



Built-up Stringer



Component Based Design

