

Homemade Solid Propulsion

Solid Propulsion Team
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Nozzle

- Cone
 - High thrust and specific impulse
 - Long and Heavy
- Bell
 - Lighter than cone
 - Shape is key
- Spike
 - Altitude compensating
 - Difficult to manufacture



Casing

Propellant Mixture

Basic

- Potassium Nitrate/Sucrose
- Potassium Nitrate/Sorbitol
- Potassium Nitrate/Dextrose
- Zinc/Sulfur (or Micrograin)

Advance

- Ammonium Perchlorate/HTPB/Epoxy/Aluminum/Iron Oxide (APCP)srb

Consideration in Propellant Mixture

- Composition and its ratio
- Particle size of fuel and oxidizer
- Grain geometry
- Safety
- C/P value
- Environmental problems

Igniter

- ❖ Composition
 - Magnesium with Copper Oxide thermitite
 - E-match igniter



- ❖ Activation
 - Wirelessly with two way radio system
 - Traditional control box with cord



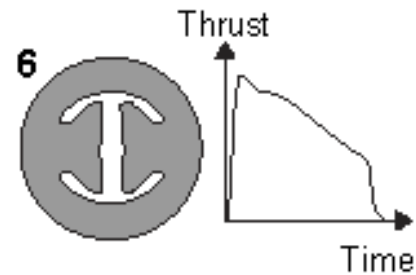
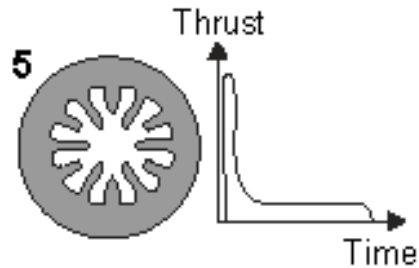
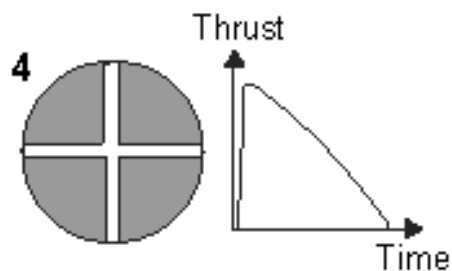
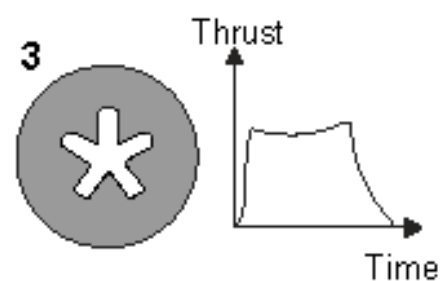
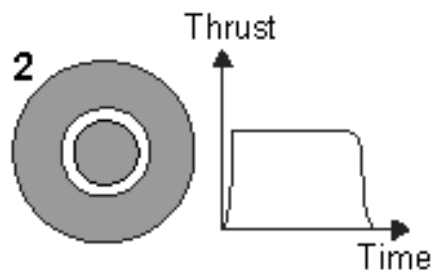
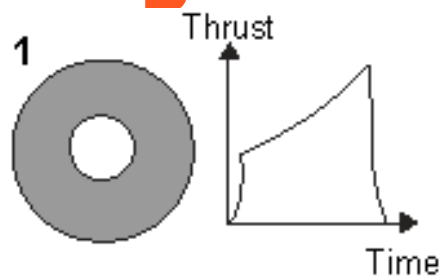
Testing

Test Stand

- Small one for a-c motor
- Full scales



Testing

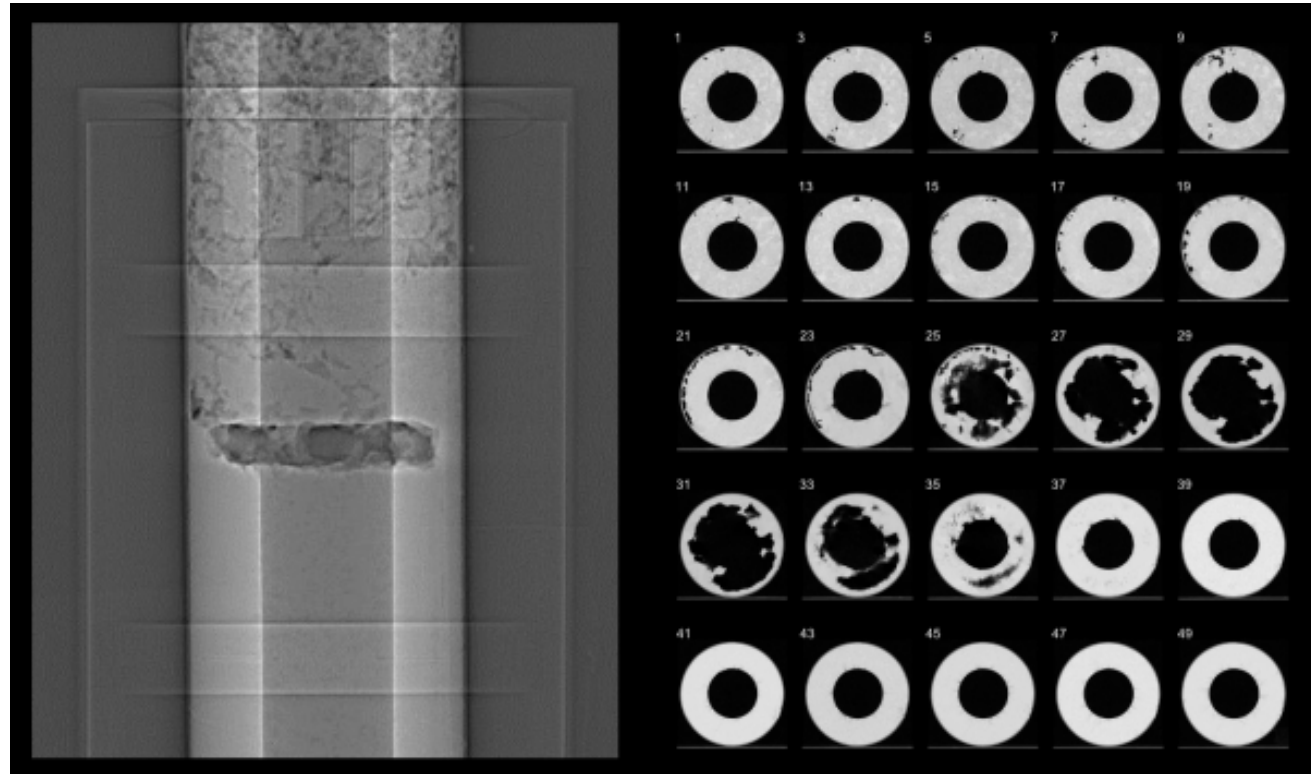


Common solid propellant core cross-sections of grain geometries, including circular, finocyl and non-circular bores.

Testing

Potential problem

- Air bubble in grain
- creak
- lifespan



<https://youtu.be/DKGOvdAO7hc?t=30s>

Thank you