

Abstract Submitted
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Fire Extinguisher Innovation Based In Nature¹ JONATHAN NEILL
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Many of today's greatest innovations are based upon principals and mechanisms
found in nature. One mechanism which shows great potential for use in con-
temporary technology is the defense mechanism of the Bombardier Beetle, which uses
exothermic reactions to heat and pressurize a chemical compound before releasing it
towards its attacker. A fire extinguisher using this same principal has the potential
to be lighter as well as have a greater range and effectiveness, than traditional fire ex-
tinguishers. We endeavor to design and build a mock-up of such a fire extinguisher.
We first focus on the pressurized heating chamber where cartridge heaters, driven
by batteries, initiate the phase change of the water. We use ANSYS simulations to
test different chamber geometries and heater configurations to optimize the balance
between heating requirements and weight limitations.

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