

PRELIMINARY DRAFT V2 June 7th

# Exploding Foil Initiator Development

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May 11, 2021



## Blue Chip® Initiator

### Blue Chip® Detonator family

- ▶ 7 Different Variations
- ▶ High voltage chip slapper detonator (low energy)
- ▶ Qualified to MIL-DTL-23659 Appendix A
- ▶ TO-5 Header
- ▶ Exploding metal foil bridge
- ▶ Polyimide flying plate
- ▶ HNS-IV energetic



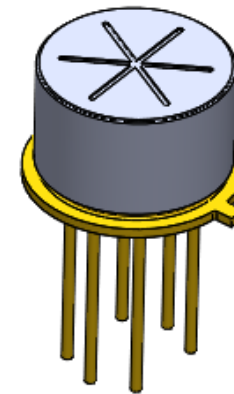
## Blue Chip® Initiator

### Slapper Detonator - Exploding Foil Initiator (EFI) based design

- ▶ Low-cost MIL-STD-1901 compliant design
- ▶ Leverages Blue Chip® Detonator design and technology
- ▶ Offers safety features of an EFI device
  - ▶ High Voltage
  - ▶ Insensitive HNS-IV explosive (used with EFI)
  - ▶ Not a Pyrotechnic Load in contact with hot bridge wire
- ▶  $\text{BKNO}_3$  pyrotechnic load



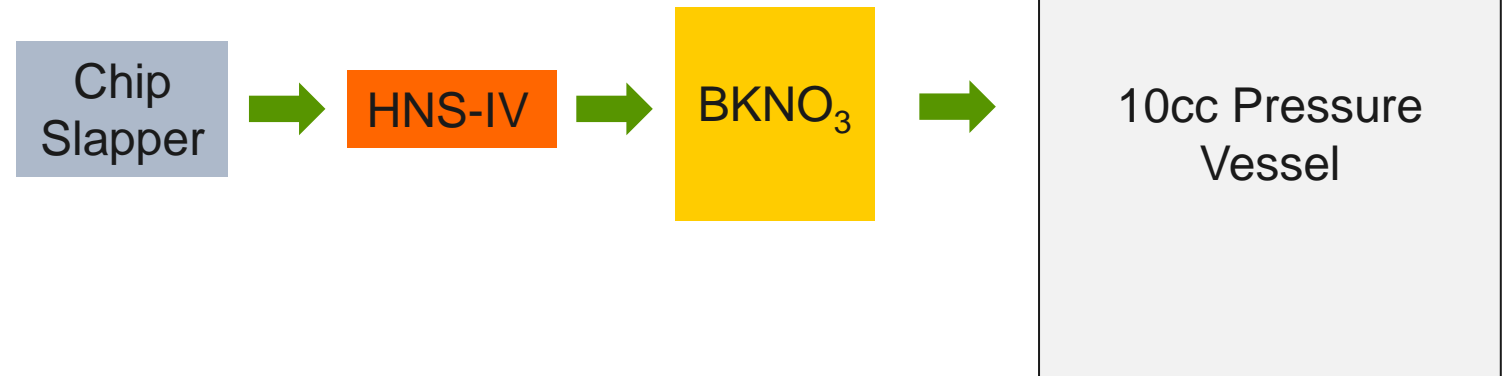
Functioned



## Blue Chip® Initiator

### Fundamentals

- ▶ High voltage chip slapper header (low energy)
- ▶ HNS-IV (detonation)
- ▶ BKNO<sub>3</sub> (deflagration)
- ▶ Hot gas/particles
- ▶ Pressure in 10cc vessel



## Blue Chip® Initiator

### Development

- ▶ BKNO<sub>3</sub> Density and Load Shape
  - ▶ Manufacturability
  - ▶ 10cc Performance
  - ▶ Temperature Test Range -40°C to 71°C
    - ▶ Potential for expanded Range

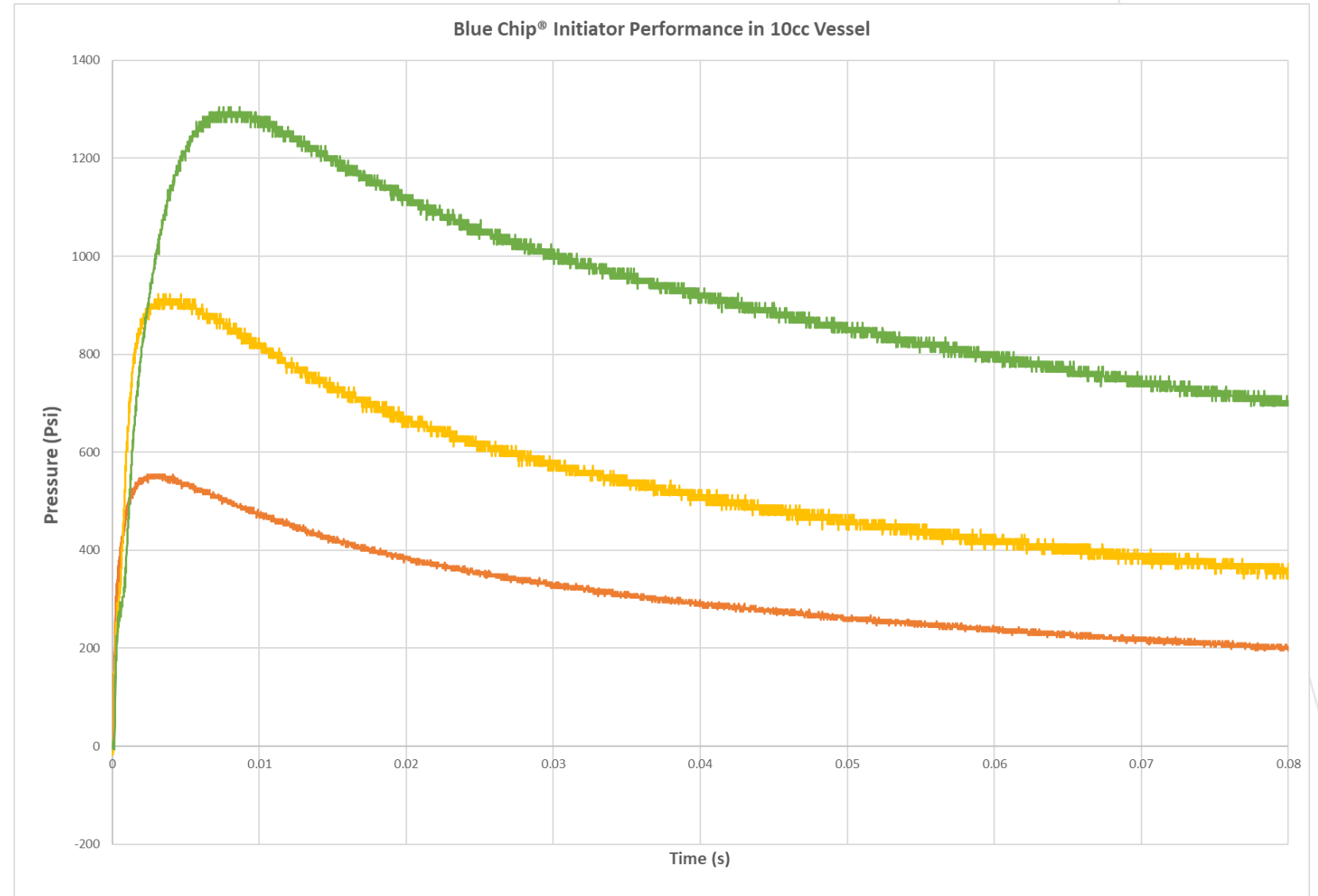


## Blue Chip® Initiator

### Output Performance

#### 10cc Pressure Vessel data

- ▶ Pressure range
  - ▶ 400 to 1300 Psi
- ▶ Time to Peak Pressure
  - ▶ 2 to 10 Millisecond
- ▶ Time to First Pressure
  - ▶ .1 to .5 Millisecond

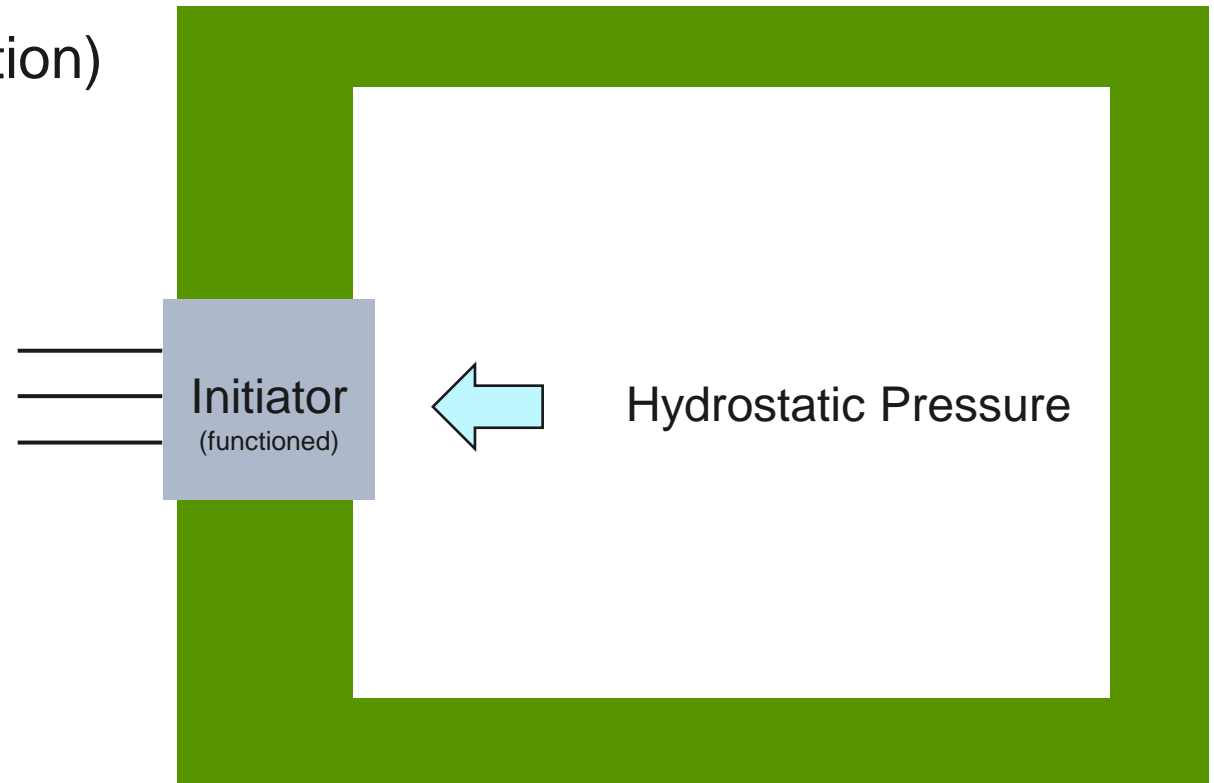


## Blue Chip® Initiator

### Performance

#### Hydrostatic Testing (post function)

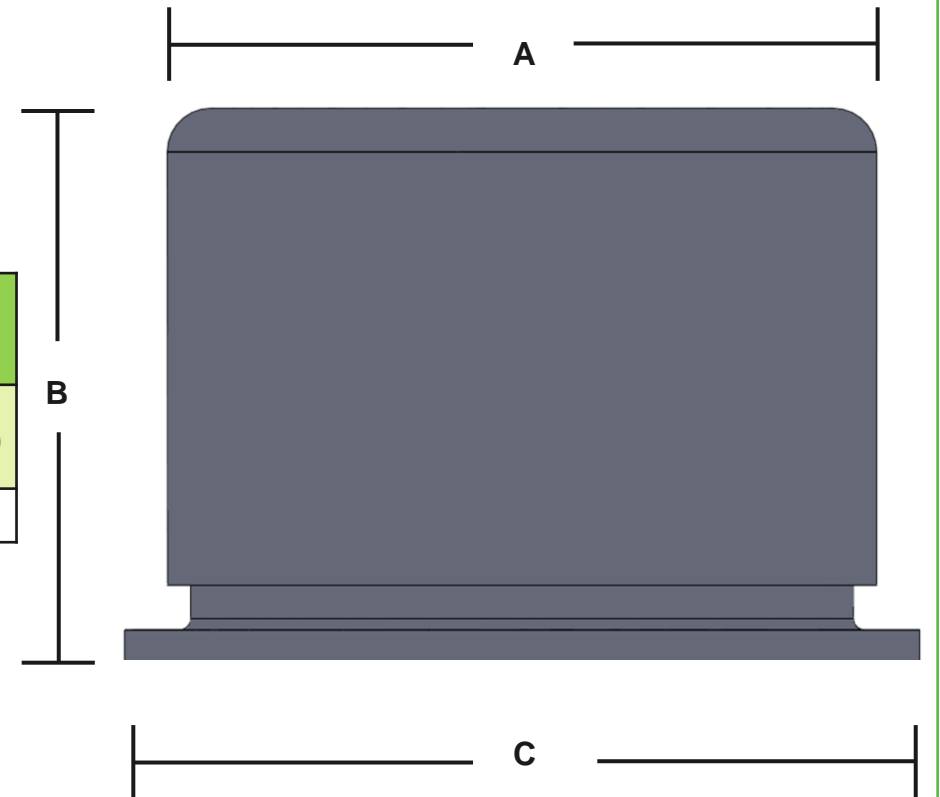
- ▶ Pressure
  - ▶ 5,500 Psi minimum
- ▶ Hold Time
  - ▶ 10 seconds minimum



## Blue Chip® Initiator

Dimensions:

A TYP.	B TYP.	C TYP.
(Ø 0.320" max)	(0.215 - .440")	(Ø 0.360")
Note: lead pins not shown		





# Exploding Foil Initiator Development



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