Exploding Foil Initiator Development

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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
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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
- BKNO₃ pyrotechnic load
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Fundamentals

- High voltage chip slapper header (low energy)
- HNS-IV (detonation)
- BKNO₃ (deflagration)
- Hot gas/particles
- Pressure in 10cc vessel

Chip Slapper  ➔  HNS-IV  ➔  BKNO₃  ➔  10cc Pressure Vessel
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Development

- BKNO₃ Density and Load Shape
  - Manufacturability
  - 10cc Performance
  - Temperature Test Range -40°C to 71°C
    - Potential for expanded Range
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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
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Performance

Hydrostatic Testing (post function)
- Pressure
  - 5,500 Psi minimum
- Hold Time
  - 10 seconds minimum

Initiator (functioned) → Hydrostatic Pressure
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Dimensions:

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<th>A TYP.</th>
<th>B TYP.</th>
<th>C TYP.</th>
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<td></td>
<td>(Ø 0.320” max)</td>
<td>(0.215 - .440”)</td>
<td>(Ø 0.360”)</td>
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Note: lead pins not shown
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