



SHOOTING
SPORTS

Lead-free Primer Strategy

May 2018

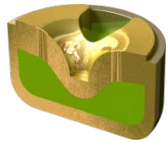
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Small Caliber Percussion Primer

- 200 Year Evolution
- Primer Ignition – heat transfer into the propellant bed
 - Flame DDNP + pyrotechnic system
 - Fuel chlorates, phosphorus
 - Slag fulminates, azides, lead styphnate
- Federal Gold Medal Primer
 - Low overpressure
 - No PETN
 - Primary heat transfer via high heat capacity metal

Catalyst Primer Technology

Primer Components and Manufacturing Consistent with Federal Gold Medal Primer Standards



The Catalyst primer employs nitro-thermite technology producing high sustained heat. The bismuth/aluminum thermite reaction creates excellent heat transfer into the propellant bed



Conventional Primer Cup



Catalyst
Pyrotechnic

NITROCELLULOSE



ALUMINUM



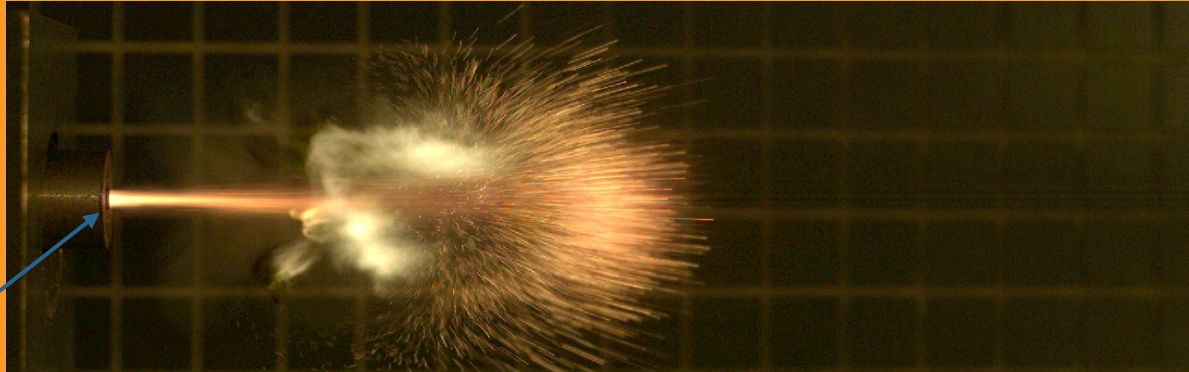
BISMUTH OXIDE



Conventional Boxer Anvil

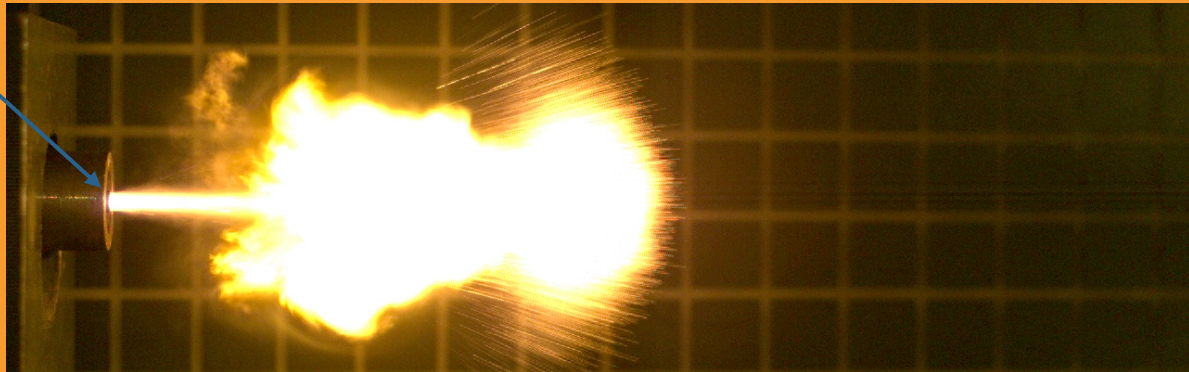
Catalyst Thermal Output

U.S. Mil
No.41 Primer



Case
mouth

Catalyst
No.41 Primer



Primed 5.56mm case

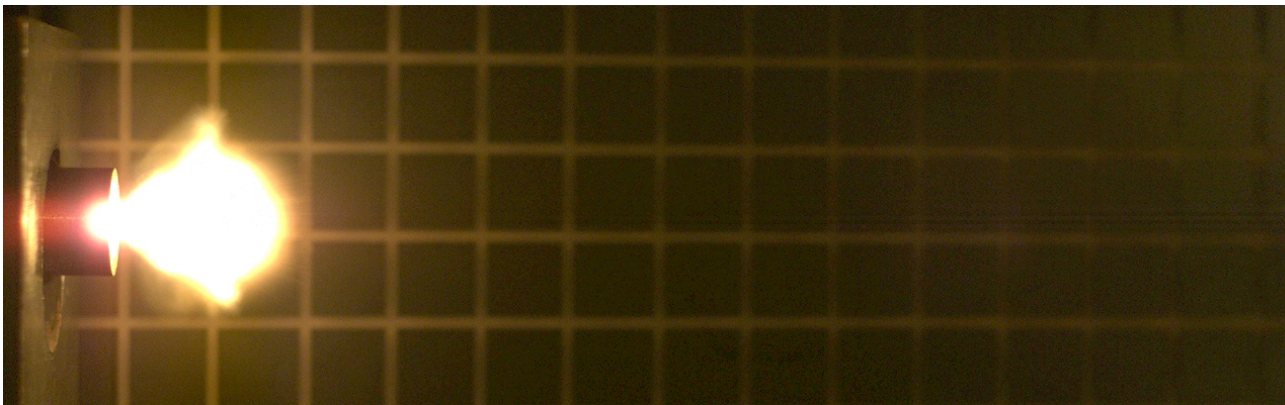
Same No.41 cup / anvil

Catalyst No.41 primer charge weight is 37% lower than U.S. Mil No.41 primer

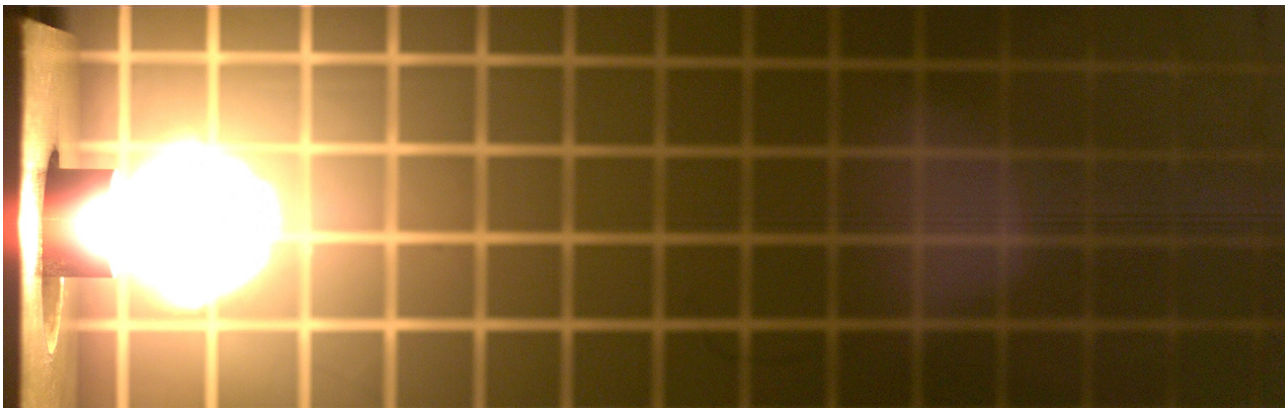
Ignition Progression

5.56mm Primed Brass

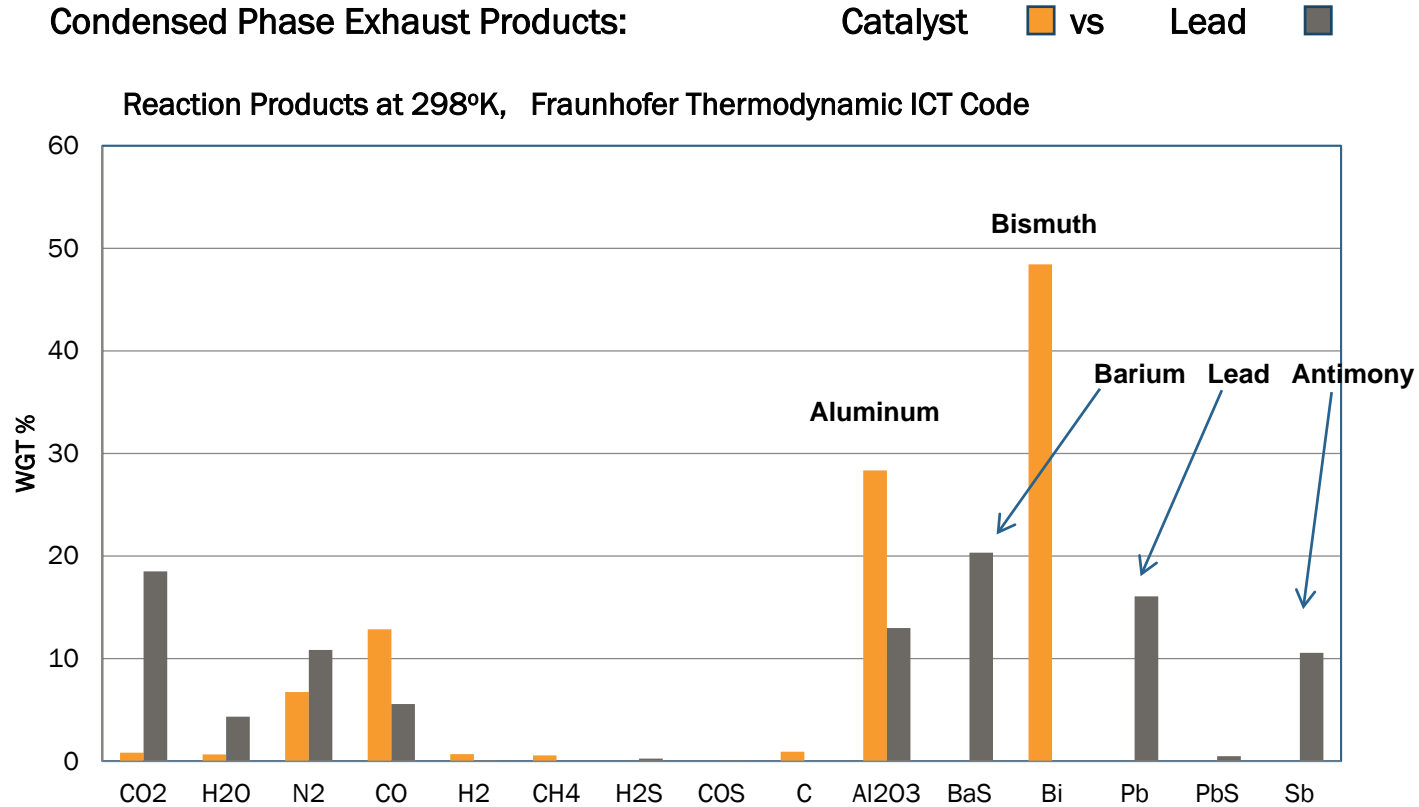
U.S. Mil
No. 41



Composite
No. 41



Non-Toxic Exhaust Products



Catalyst primer exhaust is free of Lead, Barium, and Antimony

Ballistics Example

GM308M, 168 gr Gold Medal Match

test date 4/23/2018

<u>Primer</u>	<u>Velocity / Std Dev</u>	<u>Pressure / Std Dev</u>
GM210M	2631 / 5	56,595 / 777
GM210NX	2620 / 7	59,524 / 763

notes:

NX pellet charge weight was higher than GM210M pellet charge for this sample

NX primed brass sample was not load adjusted