Chemical Analysis of Exploding Targets

Samantha Peek – ATF Intern Forensic Science Laboratory – San Francisco



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO EXPLODING TARGETS

Over the past few months, ATF Agents have contacted the Forensic Lab to inquire about the chemical components of various exploding targets. To assist Agents with their inquiry, exploding targets were purchased (September 2012 to October 2012) from numerous distributors and chemically analyzed.

All exploding targets contain an oxidizer and a fuel (catalyst). When these two components are properly mixed, the resulting mixture becomes a shock sensitive explosive.

The exploding target oxidizers and fuels were analyzed using Infrared Spectroscopy, Scanning Electron Microscope / Electron Dispersive Spectroscopy (SEM/EDS), and X-Ray Diffraction.

All analysis was supervised by Forensic Chemist John Jermain. For additional questions and information, contact John at 925.280.3607.

Additional studies dealing with exploding targets will be conducted by Forensic Chemist Brittany Crane and will be published at a later date.







UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO **EXPLODING TARGETS**



ATLAS AMMO

Exploding Targets

PURCHASED: October 2012

OXIDIZER: Potassium Perchlorate

FUEL (CATALYST): Aluminum



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO EXPLODING TARGETS



BLUE THUNDER

IIHANDLE WITH EXTREME CAUTION AND CARE!!

For use with all rimfire and centerfire pistol, rifle and shotgun cartridges and calibers.

Directions for mixing and use: ALWAYS USE ALL SAFETY PRECAUTIONS AND EQUIPMENT!

OPEN YOUR PINK ANTISTATIC SOFT PACK.

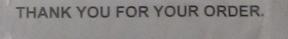
- 2 ADD THE GREY ACTIVATOR TO THE PINK ANTISTATIC SOFT PACK
- 3. RESEAL THE PACK LEAVING A LITTLE AIR IN THE BAG AND SHAKE FOR AT LEAST
- 30 SECONDS OR UNTIL ALL CONTENTS OF THE PINK PACK IS COVER WITH GREY ACTIVATOR. 4. ONCE MIXED, OPEN THE BAG AGAIN TO REMOVE THE EXCESS AIR AND RESEAL AND PLACE THE BLUE RESEALABLE PLASTIC BAG FOR VISUAL ENMANCEMENT
- PLACE THE PACK IN THE DESIRED LOCATION (50 YARDS AWAY OR MORE IS RECOMMENDED SHOOT THE TARGET IN THE CENTER OF THE FILLED AREA. AS "WINGING" THE BAG WILL NOT CAUSE DETONATION

WARNING

Misuse of this product can result in fire or loss of life or limb. Do NOT use or store near fire and flame. Avoid smoking near the product, dry debris will ignite.

Use EXTREME CAUTION WHILE MIXING. Chemicals are spark-sensitive. Use proper safety precautions and equipment at ALL TIMES.

By mixing this item you state that you understand the proper use, and release the manufacturer and/or distributor of the product from any and all liability stated, implied or otherwise from are o



BLUE THUNDER

Low Velocity Exploding Targets

Blue Thunder sales@bluethunderonline.com

PURCHASED: October 2012

OXIDIZER: Ammonium Nitrate

FUEL (CATALYST): Aluminum (3 TIMES AMOUNT OF THE HIGH VELOCITY)



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY - SAN FRANCISCO

EXPLODING TARGETS



IIHANDLE WITH EXTREME CAUTION AND CIREII

For use with .223 round or larger; 2200 fps min.

Directions for mixing and use:

ALWAYS USE ALL SAFETY PRECAUTIONS AND EQUIPMENTI

- 1 OPEN YOUR SOFT PACK
- 2 ADD THE GREY ACTIVATOR TO THE SOFT PACK
- AFSEAL THE PACK LEAVING A LITTLE AIR IN THE BAG AND SHAKE FOR AT LEAST SECONDS OR UNTIL ALL CONTENTS OF THE BLUE PACK IS COVER WITH GREY ACTIVATOR

4. ONCE MIXED, OPEN THE BAG AGAIN TO REMOVE THE EXCESS AIR AND RESEAL. PLACE THE PACK IN THE DESIRED LOCATION. (100 YARDS AWAY OR MORE IS RECOMININDED). SHOOT THE TARGET IN THE CENTER OF THE FILLED AREA, AS "WINGING" THE BAG WILL NOT CAUSE DETONATION.

WARNING

Mause of this product can result in loss of life or limb. Use proper safety precautions and equipment at ALL TIMES.

or incluing this item you state that you understand the proper use, and release the manufacturer representation of the product from any and all liability stated, implied or otherwise from use or misuse of the product.

THANK YOU FOR YOUR ORDER.

BLUE THUNDER

High Velocity Exploding Targets

Blue Thunder sales@bluethunderonline.com

PURCHASED: October 2012

OXIDIZER: Ammonium Nitrate

FUEL (CATALYST): Aluminum



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO

EXPLODING TARGETS



DA-5

Exploding Rifle Targets

Last Man Standing PO Box 1172 Temperance, Michigan 48182 419.855.BANG

PURCHASED: September 2012

OXIDIZER: Ammonium Nitrate

FUEL (CATALYST): Aluminum



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO **EXPLODING TARGETS**



DA-22

Exploding Rimfire Targets

Last Man Standing PO Box 1172 Temperance, Michigan 48182 419.855.BANG

PURCHASED: October 2012

OXIDIZER: Ammonium Nitrate

FUEL (CATALYST): Aluminum (3 TIMES AMOUNT OF THE DA-5)



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO **EXPLODING TARGETS**



H2 TARGETS

Exploding Rifle Targets

H2Targets, LLC info@h2targets.com

PURCHASED: October 2012

OXIDIZER: Ammonium Nitrate

FUEL (CATALYST): Aluminum



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO EXPLODING TARGETS



H2 TARGETS

"Boomer" .22 Long Exploding Rifle Targets

> H2Targets, LLC info@h2targets.com

PURCHASED: October 2012

OXIDIZER: Ammonium Nitrate

FUEL (CATALYST): Aluminum (3 TIMES AMOUNT OF STANDARD H2 TARGETS)



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO

EXPLODING TARGETS





"ORIGINAL" Exploding Rifle Targets

Kick-Ass Exploding Targets www.kickasstargets.com

PURCHASED: October 2012

OXIDIZER: Ammonium Nitrate

FUEL (CATALYST): Aluminum



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO

EXPLODING TARGETS



KICK-ASS

"ATX-MAGNUM" Exploding Rifle Targets

Kick-Ass Exploding Targets www.kickasstargets.com

PURCHASED: October 2012

OXIDIZER: Ammonium Nitrate

FUEL (CATALYST): Aluminum & Sulfur (trace amounts)



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO EXPLODING TARGETS





"ATX-1" Exploding Rifle Targets

Kick-Ass Exploding Targets www.kickasstargets.com

PURCHASED: October 2012

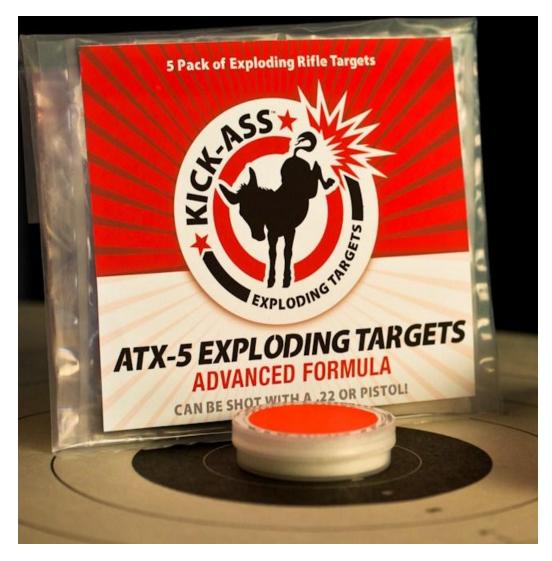
OXIDIZER: Potassium Perchlorate

FUEL (CATALYST): Aluminum & Sulfur (trace amounts)



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO

EXPLODING TARGETS





"ATX-5" Exploding Rifle Targets

Kick-Ass Exploding Targets www.kickasstargets.com

PURCHASED: October 2012

OXIDIZER: Potassium Perchlorate

FUEL (CATALYST): Aluminum & Sulfur



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO

EXPLODING TARGETS



minimum projectile weight of 40 grains.

WARNING

This product must be used once mixed. Once this product is mixed it can be transported. Due to use once mixed. Once the product is mixed it can be transported. By mixing this product you are confirming you are at least this product you read the product you are at least the pr the distributor / manual clear criminal record. By using this product you are confirming you are be distributor / manual clear criminal record. By using this product you manual record. he distributor / manufacturer of any liability for it's use or misuse. Don't ^{repackage} this product. Comply with all local, state, and federal rules real. ^{se of and/or disposal of mixed and un-detonated product.} MIDWEST Exploding Targets, LLC.

MIDWEST

Exploding Rifle Targets

Midwest Exploding Targets West Fargo, North Dakota 701.219.0264

PURCHASED: October 2012

OXIDIZER: Ammonium Nitrate

FUEL (CATALYST): Aluminum



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY - SAN FRANCISCO

EXPLODING TARGETS



RED JACKET

"MOJO MIX" Exploding Centerfire Rifle Targets

Red Jacket Firearms, LLC 9653 Mammoth Avenue Baton Rouge, Louisiana 70814 800.951.1319

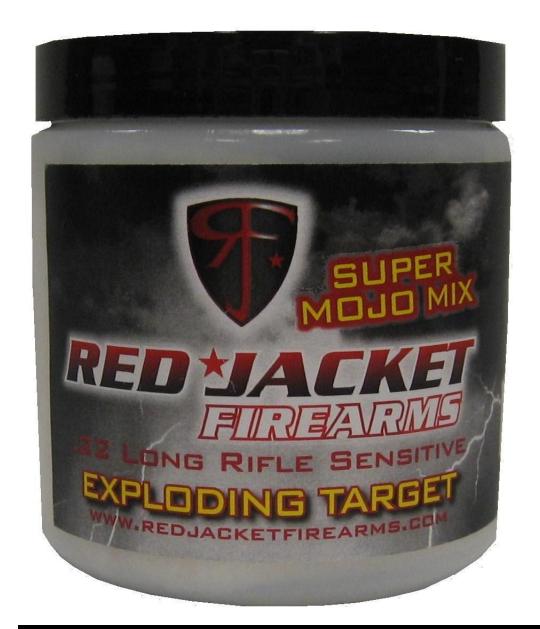
PURCHASED: October 2012

OXIDIZER: Ammonium Nitrate

FUEL (CATALYST): Aluminum



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO **EXPLODING TARGETS**



RED JACKET

"SUPER MOJO MIX" Exploding Rimfire Rifle Targets

Red Jacket Firearms, LLC 9653 Mammoth Avenue Baton Rouge, Louisiana 70814 800.951.1319

PURCHASED: October 2012

OXIDIZER: Ammonium Nitrate

FUEL (CATALYST): Magnalium (MIXTURE OF MAGNESIUM AND ALUMINUM)



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO **EXPLODING TARGETS**



SHOCKWAVE

Exploding Rifle Targets

Shockwave Targets 499 Spruce Street St. Marys, Pennsylvania 15857 814.834.2010

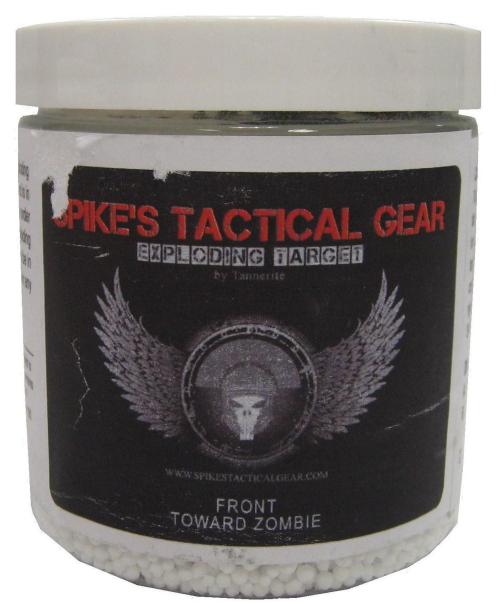
PURCHASED: September 2012

OXIDIZER: Ammonium Nitrate

FUEL (CATALYST): Aluminum



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO **EXPLODING TARGETS**



SPIKE'S TACTICAL

Exploding Rifle Targets

Spike's Tactical LLC 2593 Clark Street #103 Apopka, Florida 32703 407.928.2666

PURCHASED: September 2012

OXIDIZER: Ammonium Nitrate

FUEL (CATALYST): Aluminum



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO EXPLODING TARGETS



STAR TARGETS

Exploding Rifle Targets

Star Targets info@startargets.com

PURCHASED: September 2012

OXIDIZER: Ammonium Nitrate

FUEL (CATALYST): Aluminum



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO **EXPLODING TARGETS**



STAR TARGETS

Rimfire Exploding Rifle Targets

Star Targets info@startargets.com

PURCHASED: September 2012

OXIDIZER: Potassium Perchlorate

FUEL (CATALYST): Aluminum & Sulfur (trace amounts)



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO

EXPLODING TARGETS



SURE SHOT

Exploding Rifle Targets

Sure Shot Exploding Targets 6350-A South Hanover Road Elkridge, Maryland 21075 410.796.5996

PURCHASED: September 2012

OXIDIZER: Ammonium Nitrate

FUEL (CATALYST): Aluminum



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO **EXPLODING TARGETS**



SURE SHOT

"MAGNUM" .22 Long Exploding Rifle Targets

Sure Shot Exploding Targets 6350-A South Hanover Road Elkridge, Maryland 21075 410.796.5996

PURCHASED: September 2012

OXIDIZER: Ammonium Nitrate

FUEL (CATALYST): Magnalium (MIXTURE OF MAGNESIUM AND ALUMINUM)



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO

EXPLODING TARGETS



TANNERITE

Exploding Rifle Targets

Tannerite 36366 Valley Road Pleasant Hill, Oregon 97455 541.744.1406

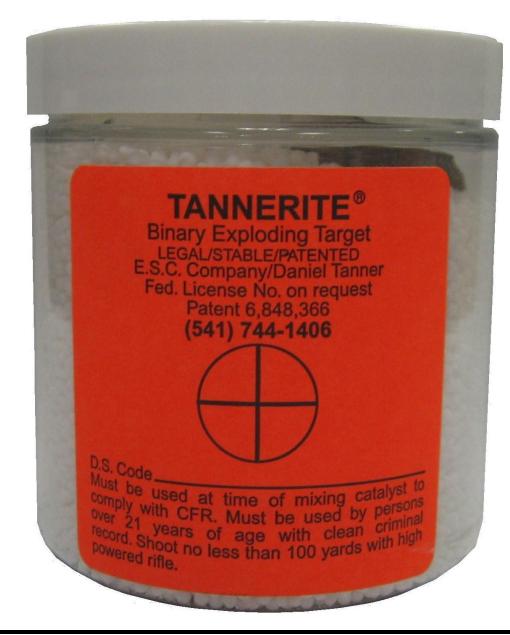
ACQUIRED: June 2010

OXIDIZER: Ammonium Nitrate

FUEL (CATALYST): Aluminum & Zirconium



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO **EXPLODING TARGETS**



TANNERITE

Exploding Rifle Targets

Tannerite 36366 Valley Road Pleasant Hill, Oregon 97455 541.744.1406

PURCHASED: September 2012

OXIDIZER: Ammonium Nitrate

FUEL (CATALYST): Aluminum (ZIRCONIUM NO LONGER IN FUEL FORMULA)



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO EXPLODING TARGETS

WHITE LIGHTNING

Rimfire Exploding Rifle Targets

Tannerite 36366 Valley Road Pleasant Hill, Oregon 97455 541.744.1406

PURCHASED: September 2012

OXIDIZER: Potassium Perchlorate

FUEL (CATALYST): Aluminum



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO

Fuel Catalyst / Comp B

Oxidizor / Comp A

EXPLODING TARGETS



ZOMBOOM!

Exploding Rifle Target

Zombie Industries 12925 Brookprinter Place, Suite 200 Poway, California 92064 858.386.0950

PURCHASED: October 2012

OXIDIZER: Ammonium Nitrate

FUEL (CATALYST): Aluminum



UNITED STATES DEPARTMENT OF JUSTICE BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES FORENSIC SCIENCE LABORATORY – SAN FRANCISCO EXPLODING TARGETS