

Semtex has earned a reputation as the explosive of choice among terrorists and in Hollywood. Terrorists use this Czechoslovakian plastic explosive because their Eastern Bloc sponsors gave it to them. Hollywood types use it because terrorists do, and writers and directors believe Semtex to be a "superexplosive" possessing extraordinary power unmatched by other explosives. Knowledgeable terrorists know better.

Semtex is the *plastique* most widely used by terrorists around the world. In what is the first book to focus solely on Semtex, noted demolitions expert Seymour Lecker sets the record straight about this powerful but misrepresented terror weapon. He tells you what it will and won't do, its strengths and its limitations, and how it compares with its U.S. counterpart, C-4. Lecker also details the explosiveness, materials, manufacturing procedures, storage characteristics, dangers, and conditions of use. Find out the vital facts about Semtex before you're confronted with a situation where what you don't know *can* hurt you. *Homemade Semtex* is for information purposes only.

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SEYMOUR LECKER

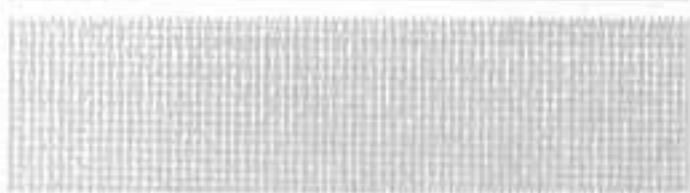


# HOMEMADE SEMTEX

C-4'S UGLY SISTER

SEYMOUR LECKER

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*Homemade Semtex:  
C-4's Ugly Sister*  
by Seymour Lecker

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# W ARNING

The chemicals and processes described in this book are all extremely dangerous. Manufacturing Semtex from improvised materials or removing RDX and PETN from commercial detonating cord and booster charges is extremely hazardous and should not be attempted. Any attempt to handle these chemicals or perform these operations, except by highly trained and experienced personnel operating in a professional environment, more likely than not will lead to injury or death.

The dangers cannot be overemphasized. *This manual is for information purposes only.* Neither the author nor the publisher assumes any responsibility for the use or misuse of information contained in this book.

# C CONTENTS

INTRODUCTION	1
<b>CHAPTER 1</b> MATERIALS	3
<b>CHAPTER 2</b> MANUFACTURING PETN	21
<b>CHAPTER 3</b> MANUFACTURING RDX	23
<b>CHAPTER 4</b> MANUFACTURING SEMTEX	25
SELECTED BIBLIOGRAPHY	27

# INTRODUCTION

*"Semtex is a superexplosive, the tool of choice of international terrorists."*

The above statement, widely believed and propagated by the news media, is false. Semtex is not a "superexplosive" possessing extraordinary qualities and more power than other types of plastic explosives. Semtex's explosive power comes from a 50-50 mixture of PETN and RDX. PETN has a relative effectiveness of 1.66; RDX has a relative effectiveness of 1.5. Semtex contains 89 percent explosive and 11 percent inert plasticizing material. C-4, the U.S. Army standard plastic explosive, is 91 percent RDX and 9 percent inert plasticizing material. Essentially, Semtex and C-4 have the same power.

But Semtex tends to bleed its plasticizers, leaving a visible oily stain. Additionally, when a plastic explosive extrudes its plasticizers, it loses some of its plastic quality. C-4

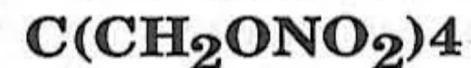
holds its plasticizers with virtually no bleeding for an extended period of time, even under adverse field conditions. All things being equal, C-4 is more desirable than Semtex.

A Czechoslovakian product, Semtex is more widely used by terrorists because it was supplied to them by their Eastern Bloc allies (although, as of this writing, political alignments in Eastern Europe have been radically altered). There is no question that knowledgeable terrorists would prefer C-4 over Semtex, if they could obtain it.

## CHAPTER ONE

# MATERIALS

## PETN



### *Synonyms*

*United States:* Pentaerythritol tetranitrate, petrin, tetranitropentaerythritol, pentaerythrite tetranitrate, penta, niperyth, nyperite, pentyl.

*France:* Penthrite.

*Germany:* Penthrite, nitropenta, NP, nitropentaerythrit, pentrite.

*Italy:* Pentrite.

*Japan:* Shoeiyaku.

### *State*

Fine crystalline or granular powder.

### *Color*

White when pure, may be light gray if

impurities are present. Color varies when wax is added as a desensitizer.

### ***Melting Point***

286°F, 141°C.

### ***Solubility***

Insoluble in water. Soluble in acetone and methyl acetate.

### ***Sensitivity***

The most sensitive of the military explosives classed as primary explosives. In a finely divided state, it is as sensitive as mercury fulminate. Very sensitive to heat, shock, and friction. Sharp blows or metal-on-metal friction is sufficient to cause detonation. Readily detonated by bullet impact and may be ignited by sparks. Not normally ignited or detonated by static electricity generated on the body or in routine handling. Extremely sensitive to ignition by lead azide but not from the spit of a fuze. Very insensitive to flame, shock, and friction in primacord so must be detonated by cap. Does not detonate under long, slow pressure.

### ***Velocity of Detonation***

26,000 feet per second at a density of 1.6 grams per milliliter.

### ***Detonating Temperature***

347°F, 175°C.

### ***Stability***

Good in storage. Usually stored wet when in bulk. Nonhygroscopic and not adversely affected by moisture. When moist, it reacts to some degree with most metals, except stainless steel and aluminum. Most metals are unaffected by the dry material. Decomposes slowly by the action of caustic soda and fairly rapidly in a solution of boiling ferrous chloride.

### ***Toxicity***

Even though not considered unduly toxic, exposure should be minimized. Contact with skin does not generally cause dermatitis, although absorption through the skin is possible. Small doses, either absorbed through the skin or inhaled, may cause a decrease in blood pressure; larger doses can cause difficult or labored breathing and convulsions.

### ***Method of Loading***

Pressing.

### ***Method of Unloading***

May be washed out with any solvent.

### ***Use***

A booster explosive, such as primacord (U.S.) and cordtex (U.K.), primarily as the explosive core of detonating cord. Also used as a booster and detonator base charge.

**RDX****Synonyms**

*United States:* Cyclotrimethylene, trinitramine, CTMTN, hexahydro-1,3,5-trinitrosym-triazine, cyclonite.

*France:* Hexogene, exogene.

*Germany:* Hexogen.

*Italy:* T4

*Japan:* Tanoyaku, shouyaku.

**State**

Crystalline solid.

**Color**

White.

**Melting Point**

396°F, 202°C.

**Solubility**

Moderately soluble in hot acetone.  
Readily soluble in hot phenol.

**Sensitivity**

About halfway between tetryl and PETN.  
Appreciably reduced by the addition of wax.

**Velocity of Detonation**

27,000 feet per second at a density of 1.6 grams per milliliter.

**Detonating Temperature**

Approximately 355°F, 235°C.

**Stability**

Very good in storage. Nonhygroscopic and not adversely affected by moisture. Reacts slightly with copper-plated steel. Mixtures of RDX and oxides of copper or iron ignite at temperatures slightly above 212°F, 100°C. Does not react with common metals or nitric acid.

**Toxicity**

Not markedly toxic and generally does not cause dermatitis. If ingested, however, it may affect the central nervous system.

**Method of Loading**

In U.S. ordnance, it is always used with a desensitizer. In explosives such as HBX and H-6, RDX is cast with TNT. In composition A-3 and CH-6, it is pressed.

**Method of Unloading**

Pure RDX may be washed out with a suitable solvent but not steamed out because of its high melting point. Cast charges contain-

ing RDX can be steamed out; pressed charges cannot.

### *Use*

A booster explosive used as the explosive core of some varieties of detonating cord. A detonator in some German and Italian ordnance. In the United States, primarily as a component of explosive mixtures. May be used pure in Soviet detonators.

## ACETONE



### *Synonyms*

Dimethyl ketone, ketone propane, propanone, 2-propanone.

### *Description*

Colorless liquid. Sweetish odor.

### *Uses*

Solvent. Drying and cleaning parts of precision equipment. Delusterant for cellulose acetate fibers. Specification testing of vulcanized-rubber products.

### *Hazards*

Moderately toxic by ingestion and inhalation. Can irritate skin. Narcotic in high concentrations.

### *Additional Information*

Fumes can react vigorously with oxidizing materials, making it an explosive hazard. Ranks forty-second in volume among industrial chemicals produced in the United States.

**AMMONIA****Synonyms**

None.

**Description**

Colorless liquid or gas. Sharp, irritating odor.

**Uses**

Fertilizers. Refrigerant. Condensation catalyst. Dyeing. Manufacturing chemicals (including nitric acid), steel, synthetic fibers, petroleum, latex, rocket fuel, and explosives.

**Hazards**

Highly toxic. Inhalation of concentrated fumes may cause death. Irritates eyes and skin.

**Additional Information**

Forms explosive compounds in contact with many materials, including silver, mercury, nitric acid, and picric acid. The third highest-volume industrial chemical produced in the United States.

**AMMONIUM BICARBONATE****Synonyms**

Ammonium acid carbonate, ammonium hydrogen carbonate.

**Description**

White crystals.

**Uses**

Fire-extinguishing compounds. Degreasing textiles. Removing boiler scales. Treating compost. Leavening agent for cookies, crackers, and cream-puff dough. Manufacturing ammonium salts, dyes, pharmaceuticals, and foam rubber.

**Hazards**

Produces highly toxic fumes when heated to 35°C.

## FORMALDEHYDE

### HCHO

#### *Synonyms*

Methanal, methyl aldehyde, formalin, oxymethylene, formic aldehyde.

#### *Description*

Clear, water-white, very slightly acidic gas or liquid. Pungent odor.

#### *Uses*

Manufacturing resins, ethylene glycol, and other chemicals. Fertilizer, disinfectant, embalming fluids, preservatives, industrial sterilants. Particle board, plywood, and foam insulation. Reducing agent in the recovery of gold and silver. Corrosion inhibitor in oil wells. Durable-press treatment for fabrics. A versatile chemical intermediate.

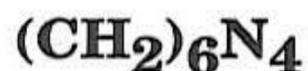
#### *Hazards*

Highly toxic. Irritates skin and eyes. Can cause violent vomiting, diarrhea, and collapse.

#### *Additional Information*

Reacts violently with performic acid

(HCHOOOH, also known as peroxyformic acid or formyhydroperoxide) and other chemicals. It is the twenty-fourth highest-volume industrial chemical produced in the United States.

**HEXAMETHYLENETETRAMINE*****Synonyms***

Methernamine, formamine, hexamine, utrotropin, metramine, HMTA, aminoform. Frequently but erroneously called hexamethyleneamine.

***Description***

White crystalline powder or colorless lustrous crystals.

***Uses***

Curing of phenolformaldehyde and resorcinolformaldehyde resins. Protein modifier. Organic synthesis. Rubber accelerator. Antibacterial fungicide. Shrink-proofing textiles. Corrosion inhibitor. Manufacturing rubber-to-textile adhesives, pharmaceuticals, high explosives, and fuel tablets.

***Hazards***

Moderately toxic. Irritates skin. Fumes should not be inhaled.

***Additional Information***

Can react with oxidizing materials.

Reacts violently with sodium dioxide.

## NITRIC ACID



### *Synonyms*

Aqua fortis, hydrogen nitrate, azotic acid, engraver's acid.

### *Description*

Transparent, colorless, or yellowish fuming liquid.

### *Uses*

Manufacturing ammonium nitrate fertilizer, dyes, drugs, lacquers, cellulose nitrate, nitrate salts, rubber chemicals, and urethanes. Ore flotation. Metallurgy. Photoengraving. Etching steel. Reprocessing spent nuclear fuel.

### *Hazards*

Highly toxic. Extremely corrosive to body tissue. Causes extensive damage to the eyes and respiratory system.

### *First Aid*

*Inhalation:* Move victim to fresh air. Give artificial respiration or oxygen if victim has stopped breathing. Even if damage

to respiratory system apparently clears up, it will, *in all cases*, return in a few hours in a more serious form.

*Skin contact:* Remove contaminated clothing. Wash with copious amounts of water.

*Eye contact:* Wash with large amounts of water.

Seek medical attention in all cases of exposure!

### *Additional Information*

Tenth highest-volume industrial chemical produced in the United States.

**PENTAERYTHRITOL****Synonyms**

PE, pentek, penetek, tetramethylol-methane, monopentaerythritol.

**Description**

White crystalline powder.

**Uses**

Manufacturing alkyd resins, rosin, tall oil esters, special varnishes, pharmaceuticals, plasticizers, insecticides, synthetic lubricants, explosives, and paint swelling agents.

**Hazards**

Moderately toxic. Generally considered to be a nuisance dust.

**Derivation**

Reaction of acetaldehyde with an excess of formaldehyde in an alkaline medium.

**Additional Information**

Can react with oxidizing materials. Reacts violently with sodium dioxide.

**SODIUM CARBONATE****Synonyms**

Soda monohydrate, crystal carbonate.

**Description**

White, colorless crystalline powder.

**Uses**

Principally a general-purpose food additive.

**Hazards**

Concentrated doses can be toxic.

**Additional Information**

Can react violently with aluminum, sulfuric acid, and other chemicals.

## CHAPTER TWO

# **M**ANUFACTURING PETN

PETN can be manufactured by treating pentaerythritol with nitric acid and adding concentrated sulfuric acid to complete the separation of the PETN. In the United States, it is manufactured with nitric acid alone:



1. Add approximately 5 pounds of pentaerythritol to 23 pounds of 96 percent nitric acid in a nitrator, continuously stirring and cooling the acid. The initial temperature of the acid should be 18°C when you begin to add the pentaerythritol, and you should add it at a rate that raises the temperature to and then maintains it at 22 to 23°C. Continue stirring and cooling for 20 minutes after adding all of the pentaerythritol.

2. Stir the acid solution into about 60 pounds of cold water in a drowning tank.
3. Catch the precipitated PETN on a glass-cloth filter, wash it with water, mix with 90 gallons of cold water containing 2.5 ounces of sodium carbonate, and refilter to separate from the slurry.
4. Wash again with water and dissolve the PETN in 30 pounds of 98-percent acetone heated to 50°C and containing one ounce of ammonium bicarbonate.
5. Add cold water to the acetone solution to precipitate the PETN. Trap the precipitated solid on a filter and wash with water to remove the acetone. The water-wet material is the final product, as it generally is not dried before being used.

## CHAPTER THREE

# MANUFACTURING RDX

RDX can be manufactured by the nitration of hexamethylenetetramine, which results from the reaction of formaldehyde and ammonia.

1. Slowly add one part by weight of hexamethylenetetramine to 11 parts of 100 percent nitric acid, while maintaining the temperature of the nitric acid at or below 30°C and stirring vigorously. The reaction proceeds according to the following equation:



When this mixture is allowed to stand, the nitric acid oxidizes the formaldehyde (HCHO), which is liberated by the reaction.

2. After letting it cool to 0°C, stir the mixture for 20 minutes more and then drown in ice water. The resulting rupture and degradation of the hexamethylenetetramine molecule form numerous aliphatic and cyclic nitrocompounds (impurities) that make up crude RDX.
3. Catch this crude RDX on a filter and wash with water to remove most of the acid. It is important to remove all but a trace of acid.
4. Purify by grinding the wet material then treating with boiling water.

## CHAPTER FOUR

# MANUFACTURING SEMTEX

Three ingredients are used to manufacture improvised Semtex: powdered RDX, powdered PETN, and a plasticizer. From personal experience, I recommend using petroleum jelly as the plasticizer when improvising plastic explosives.

1. Pulverize the RDX and PETN by using a rolling pin and cutting board. The finer the powder, the more effective the end product.
2. Pour equal parts by volume of the powdered RDX and PETN into a glass jar and shake gently until the powders are mixed well.
3. Pour the mixed powders into a wide bowl and slowly and thoroughly knead the petroleum jelly into the powder.

The jelly contributes nothing to the explosive effect. Its purpose is to provide the plastic qualities and bind the powders. Use as little as possible to achieve the proper consistency.

4. Unless it is being pressed into a mold, wrap the improvised Semtex in plastic wrap and seal with tape. Each wrapped charge should be no less than 100 grams and no more than one kilogram.
5. When ready to use, poke a hole through the plastic wrap with a nonmetallic object and insert a blasting cap.

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## **S** E L E C T E D B I B L I O G R A P H Y

*The Anarchist Arsenal*  
David Harber  
Paladin Press, 1990

*Black Book Companion*  
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*Blaster's Handbook*  
The DuPont Company

*The Chemistry of Powder and Explosives*  
T. D. Davis  
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