Hazardous Materials Refresher Training

Many new materials and processes have made our job more dangerous and challenging

We will briefly discuss the following nine topics in this refresher;

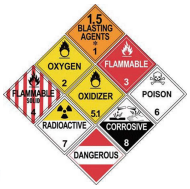
- Recognition & Identification
- Chemical Properties and Behaviors
- DECON
- Ethanol
- Fentanyl
- Butane Hash Oil
- Crude Oil
- Chemical Suicides
- Illicit Labs

Any Incidents Recently??

Hazmat…

Unknowns…

Recognition & Identification



Historically, the failure of responders to recognize the presence of hazardous materials has led to unnecessary injuries and deaths.

First responders must be diligent and observant of the hazardous materials present at every emergency.

We will review the 7 clues to the presence of hazardous materials in the following slides.

Clue #1: Occupancy Types, Locations, and Pre-incident Surveys

An obvious location of hazardous materials

Some are sometimes not so obvious

Some may not be obvious at all

Situational Awareness

Pre incident surveys

A survey or pre plan of a facility or location before an emergency rakes place in order to prepare an appropriate response.

These surveys may also identify potential terrorist targets

Clue #2: Container shapes

Containers can be categorized as; Bulk and non bulk, pressure and non pressure, bulk capacity-fixed facility container's, transportation packaging


Bulk Pressure Tank


Bulk Low Pressure Tank

The ability to identify the container will help to identify the product, pressures, temperatures, state of mater, and predict the products actions.


Cryogenic Storage Tank

The same holds true for transportation Rail Containers

Courtesy of Rich Mahaney


Pressure Rail Car


Cryogenic Rail Car

Low Pressure Rail Car


Box cars and Gondolas


Open Hopper Car


Pneumatic Unloading Cars

And miscellaneous other cars

Over the Road Containers


Pressure Cargo Tank


Cryogenic Cargo Tank


Low Pressure Cargo Tank


Box trailer


Dry Bulk


Refrigerated Box Truck

Intermodal Containers


Dry Box Container


Cryogenic Containers


Tank Containers


Open Top Container


Tube Type


Reefer Containers

There are a variety of vessel cargo carriers that are likely to contain hazardous materials

- Tanker
  Petroleum, Chemical, Liquefied Flammable

- Cargo Vessel
  Bulk, Break bulk, Container Vessel

- Barge

Intermediate Bulk Containers


Totes


Bags


Ton Containers

Courtesy of Rich Mahaney

Non Bulk Packaging

Pressure and non-pressure

Containers for radioactive materials protect against increasing levels of hazards.


Type A


Type B


Type C

Clue #3: Placards, labels, and Markings

- UN Hazard Classes
- Four Digit Identification Numbers
- DOT Placards, Labels, and Markings

UN Hazard Classes

Class 1 – Explosives

Class 2 – Gases

Class 3 - Flammable Liquids

Class 4 - Flammable Solids

Class 5 - Oxidizing substances and Organic Peroxides

UN Hazard Classes

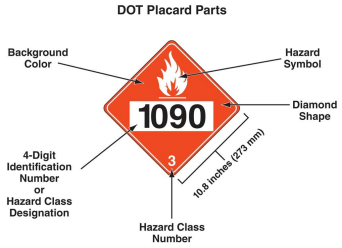
Class 6 – Toxic and Infectious Substances

Class 7 – Radioactive Materials

Class 8 – Corrosive Substances

Class 9 – Miscellaneous Dangerous Substances and Articles

U.S. DOT placards are unique for each hazard class.



Materials Requiring Placards- Any Amount

TABLE 1

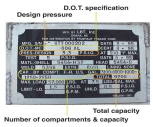
Category of material (Hazard Class or division number and additional description, as appropriate)	Placard name
1.1	EXPLOSIVES 1.1
1.2	EXPLOSIVES 1.2
1.3	EXPLOSIVES 1.3
2.3	POISON GAS
4.3	DANGEROUS WHEN WET
5.2 (Organic peroxide, Type B, liquid or solid, temperature controlled)	ORGANIC PEROXIDE
6.1 (Materials poisonous by inhalation (see §171.8))	POISON INHALATION HAZARD
7 (Radioactive Yellow III label only)	RADIOACTIVE[1]

Materials that Require Placards at 1,001 Pounds

Table 2

CLASS OR DIVISION	PLACARD TYPE
1.4	Explosives 1.4
1.5	Explosives 1.5
1.6	Explosives 1.6
2.1	Flammable gas
2.2	Nonflammable gas
3 Flammable liquid	Flammable
3 Combustible liquid	Combustible
4.1	Flammable solid
4.2	Spontaneously combustible
5.1	Oxidizer
5.2 (Other than organic peroxide)	Organic peroxide
6.1 (Other than inhalation)	Poison
6.1 (PG III)	Keep away from food
8	Corrosive
9	Class 9

Vehicles and Rail Cars have markings that can assist with identification



Vehicle

Rail Markings

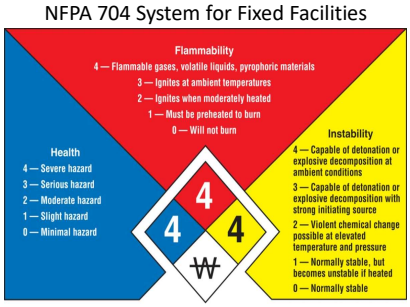
Intermodal

Clue #4: Other Markings and Colors

- OSHA Hazard Communication Standard (Workplace)
- Manufacturers and Pesticide Labels
- CAS Numbers
- Globally Harmonized System
- Military, Pipelines, and Color Codes

Canada and Mexico has their own similar marking systems.

NFPA 704 System for Fixed Facilities



Clue #5: Written Resources

- Shipping Papers
- SDS (Safety Data Sheets)
- ERG (Emergency Response Guidebook)
- NOISH Pocket Guide
- Inventory Records and Facility Documents

The Emergency Response Guidebook (ERG)

- Aides in quickly identifying specific or generic habits
- Aides in protecting responders and general public
- **Does not** address all possible circumstances
- Designed for use at highway or railroad incidents
- Associated with open areas
- Limited value in fixed-facility locations or urban settings

It is also available as a free APP

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A review of and changes to the 2016 ERG

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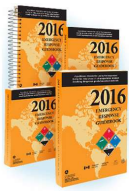
Other sections of note in the ERG

- Hazard Identification Numbers (Page 14 & 15)
- Pipeline Transportation (Page 20 thru 25)
- User Guide (Page 358 thru 367)
- BLEVE – Safety Precautions (Page 368 & 369)
- Criminal/Terrorist Section (Page 370 thru 373)
- IED Safe Standoff Distances (Page 374 375)
- Glossary (Page 376 thru 386)



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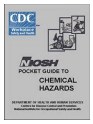
NIOSH Pocket Guide

Includes information on the following;

- Chemical Structures and Identification Codes
- Synonyms and Exposure Limits
- Chemical & Physical Properties
- Incompatibilities & Reactivity's
- Respirator Selection
- Signs & Symptoms of Exposure
- Target Organs and Emergency Treatment



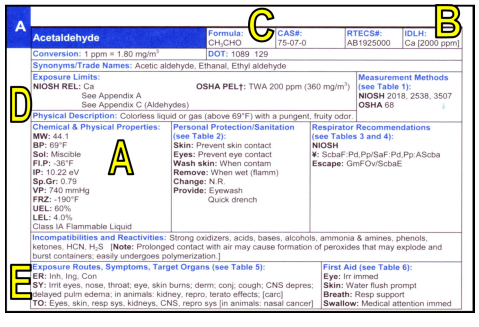
Available as an APP for a fee

The Roman Numeral Pages

Explain how to use this book and contain the Tables

- **Table 2** - Personal Protection and Sanitation Codes
- **Table 3** - Symbols, Code Component, and Codes used for Respiratory Protection.
- **Table 4** - Selection of N-, R-, or P- series Particulate Respirators
- **Table 5** - Abbreviations of Exposure Routes, Symptoms, and Target Organs
- **Table 6** - Codes for First Aid Data

Materials are listed alphabetically



DOT Chart 16

This chart affords a great deal of on the go information.

Clue #6: Senses

Vision is the safest of the five senses

- Direct Visible Evidence
- Physical Actions
- Chemical Reactions
- Physical Signs and Symptoms of Exposure

Don't forget "Common Sense"

Clue #7: Monitoring and Detection Equipment

- Can be used in determining the presence of hazardous materials and concentrations.
- Can be used to determine scope of the incident
- Effective use requires actual contact with the product and may be out of the scope for Awareness Level Personnel

The 4-Gas Meter

The Types of Sensors, the "Basics"

- O2 Reads in percent
- LEL Reads in Percent (calibration gas)
  "REMEMBER".. Percent of the LEL, not Percent in air
  Conversion factors may be needed to be accurate
- H_2S Reads in ppm
- CO Reads in ppm

Other Types of Meters

Single Gas (Product Specific)

CO, HCN, Ammonia, Chlorine

PID (Photo Ionization Detectors)

Generally uses a 10.6 lamp

There are many more types of metering devices on the market

Chemical Properties and Haz-Mat Behavior

B - 52

Terms

States of Matter: Solid, Liquid, Gas (Compressed and Liquefied)

Gases can undergo a physical change due to changes in Heat, Temp., and Pressure

Expansion Ratio: Volume increase when a liquid changes to a gas

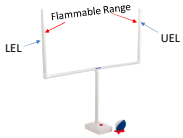
Flammability: Flash Point, Autoignition Temperature

Flammable Range:

Also called explosive or combustible range

LEL: Lower explosive limit

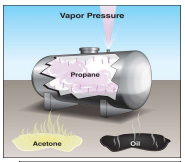
UEL: Upper explosive limit



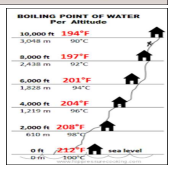
Vapor Pressure:
Tendency of a substance to evaporate

Boiling Point: Rate of evaporation

BLEVE: Boiling Liquid Expanding Vapor Explosion



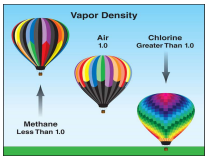
Melting Point/Freezing Point/Sublimation



All of these are directly related to atmospheric pressure

Vapor Density
In relation to air which has a value of 1

NIOSH refers to this as RgasD



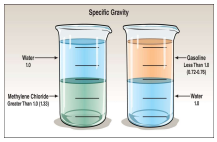
Solubility/Miscibility (In water)

Polar solvents have an attraction for water

Jack and Water

These actions are temperature dependent

Specific Gravity: The relation of a substance to water which has a value of 1

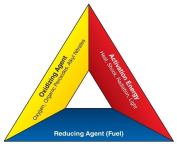


Persistence:
How long will the product hang around

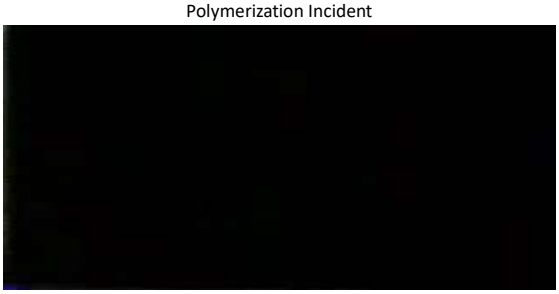
Has an impact on DECON and cleanup operations

Reactivity: Ability to undergo a chemical reaction with another material

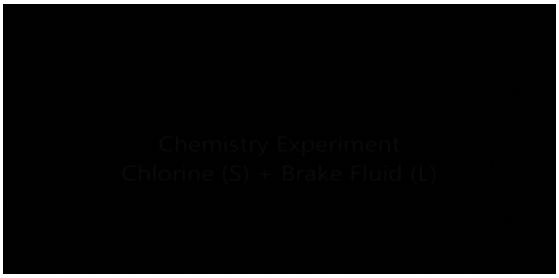
- **Polymerization**; A catalyst causes molecules to combine, sometimes rapidly.
- **Inhibitors;** Products added to control the reaction



Polymerization Incident



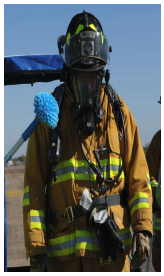
Mild Reaction



Violent Reaction

Decontamination

The process of removing hazardous materials to prevent the spread of contaminants beyond a specific area and reduce contamination levels that are no longer harmful



Types of DECON

Wet: Washing with water

Dry: Vacuuming, Brushing, Scraping, Using Sticky Tape

Physical: Hands on

Chemical: Changing the contaminant thru a chemical process

Decon Methods

Emergency Decon:
Remove contaminants ASAP

Technical Decon:
Planned and systematic

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Mass Decon

RAM

MDU

All victims must be considered; Ambulatory, Non-Ambulatory, and Deceased

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Massachusetts Chemical/Radiological/Biological Incident Response Activation Levels

Statewide Mass Decontamination Response System

Level	***Response***	***Situation***	***State HM Response***
Mass Decon	I/C requests specific MDUs event (deployment not pre-planned)	Limited/Controlled	Tier 3
Mass Decon	1-2 District MDU's to scene & MDUs to local hospitals	Moderate; single facility limited occupancy (office building)	Tier 3

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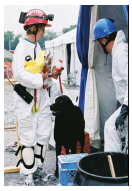
Massachusetts Chemical/Radiological/Biological Incident Response Activation Levels

Statewide Mass Decontamination Response System

Level	*Response*	*Situation*	*State HM Response*
Mass Decon	5 - 7 MDUs to scene & hospitals in effected & surrounding fire districts covered by MDUs	Major: Shopping Mall, Public Arena or multiple buildings	Tier 5
Mass Decon	Up to 17 District MDUs to scene. Most hospitals in the state covered by MDUs	Extreme: Wide geographic area or major event	Tier 5

Special Considerations

Evidence Canines Police Suspects


Equipment and tools may also need Decon


Determine the Effectiveness of Decon Operations

Now, lets do an exercise.

Using the ERG, NIOSH Pocket Guide, and any other reference that you may have, see if you can identify the type of cargo the truck is carrying in the following slide.

Photo by Roland LaRochelle

This is what's in the truck

Titan Compressed Natural Gas Truck

4 Composite Cylinders
43 ½ inches in Diameter
38 ½ feet long

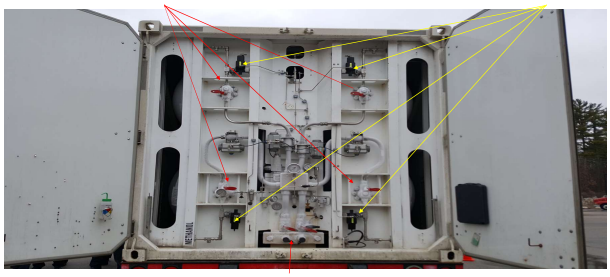
CNG Capacity of 8,886 Standard Cubic Feet.
Liquid capacity of 2,219 gallons

What do you think you will see when you open the rear doors of this truck

This is what's in the back

SHUTOFFS AT EACH CYLINDER

PRESSURE RELIEF DEVICES



Load/offload connections

Photo by Roland LaRochelle

Clues

Photo by Roland LaRochelle

Don't forget the shipping papers

Source Portable Pipelines for First Responders Chris Christopoulos, Jr.

This was a short review of the following program;

Street Smart Portable Pipelines

Chris Christopoulos, Jr.

Watch for class scheduling on the Academy's Web Site

ETHANOL

In Massachusetts:

2-3 times a week 6+ Million Gallons Transported by Rail-Barge-Truck

Ethanol Trains Impact 88 Massachusetts Communities

2017 Production in the United States- 14,903 billion gallons

Now the largest volume of hazardous materials shipped by rail

Source: MassDEP, MassDFS, US DOE

What is Ethanol?

A colorless volatile flammable liquid C_2H_5OH that is the intoxicating agent in liquors and is also used as a solvent and in fuels – also called *ethyl alcohol*, *grain alcohol*

Source: Merriam-Webster.com

What is Denatured Ethanol?

Ethanol (alcohol), with additives such as gasoline, makes it unsuitable for drinking

Used as gasoline additive

Source: Ecolink.com

Chemical Properties Comparison

Gasoline	Ethanol
➢ Vapor Density: 3.0 to 4.0	➢ Vapor Density: 1.59
Gasoline vapors seek low levels/remain close to the ground	*Ethanol vapors seek low levels/remain close to the ground*
➢ Specific Gravity: 0.72 – 0.76	➢ Specific Gravity: 0.79
Will float on top of water	*Lighter than water* ***Thoroughly mix with water***

Source: EERCA/IAFC/RFA

Chemical Properties Comparison

Gasoline	Ethanol
➢ Flammable Material	➢ Flammable Material
➢ Motor Fuel	➢ Motor Fuel
➢ Hydrocarbon	➢ Polar Solvent
➢ Flashpoint -45˚F	➢ Flash Point 55˚F
➢ Flammable Range 1.4% to 7.6%	➢ Flammable Range 3.3% to 19%

Source: EERCA/IAFC/RFA

Ethanol's Greatest Hazards

- ➢ Its Flammable
- ➢ Transloading Operations
  - ○ Conducts Electricity

Electrocution Hazard
Ignition Sources
Static Electricity

Source: MassDEP/MassDFS

A Unit Train, Palmer Mass.

Water Solubility Ethanol

- Ethanol is miscible in water, soluble at any concentration www.differencebetween.net
- Dilution may not be the solution
  1000 gallons of Ethanol needs 4000 to 5000 gallons of water to dilute
  - Where does the runoff go?
  - Where does burn-off go?

Source: EERCA/IAFC/RFA

Ethanol (A Polar Solvent)

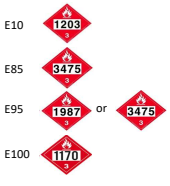
What is a polar solvent? Alcohol - Acetone - MEK

In simple terms, it mixes with the most popular solvent, WATER

Source: MassDFS

Common Ethanol Blended Fuels

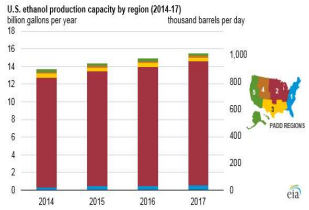
- 3-Common Ethanol Blended Fuels
  - E-10 (Most Common)
  - E-85
  - E-95
- Pure Ethanol
  - E-100



Source: EERCA/IAFC/RFA

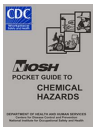
The Risks

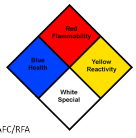
- The fastest growing commodity in transportation
- Polar Flammable Liquid
- Requires unusual firefighting equipment and tactics
- Unique environmental impacts when released



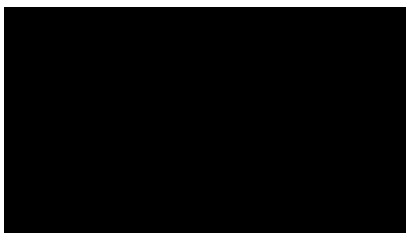
Source: EERCA/IAFC/RFA

Hazard & Risk Assessment





Source: EERCA/IAFC/RFA



Fire Control & Vapor Suppression

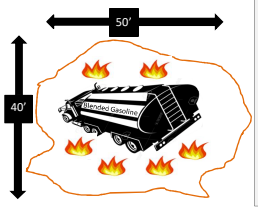
- AR-AFFF
  - Alcohol Resistant Aqueous Film Forming Foams
- Dry Chemical
  - Foam Compatibility

You'll need a lot of it!

Source: MassDEP/MassDFS

Road Tanker Spill – Ignited Hydrocarbons

Extinguish - minimum 15 minutes resources AFFF or AR-AFFF @ 0.10 gpm/sq. ft.

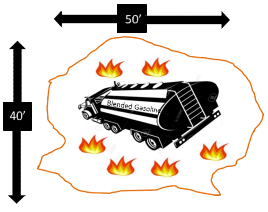


AREA	x	RATE	=	GPM of Solution
2000		0.1 assume worst case		200 gpm
GPM	x	%CON.	=	GPM of Concentrate
200		.03		6 gpm
GPM	x	%Water	=	GPM of Water
200		.97		194 gpm
GPM	x	TIME	=	TOTAL GAL CONC.
6		15		90 gal
GPM	x	TIME	=	TOTAL GAL WATER
194 gpm		15		2,775 gal

Source: Cottrell Associates

Road Tanker Spills - Ignited Alcohol

Extinguish - minimum 15 minutes resources AR-AFFF @ 0.20 gpm/sq. ft.



E98 E95

AREA	x	RATE	=	GPM of Solution
2000		.2 assume worst case		400 gpm
GPM	x	%CON.	=	GPM of Concentrate
400		.03		12 gpm
GPM	x	%Water	=	GPM of Water
400		.97		388 gpm
GPM	x	TIME	=	TOTAL GAL CONC.
12		15		180 gal
GPM	x	TIME	=	TOTAL GAL WATER
388		15		5820 gal

Source: Cottrell Associates

Liquid Methanol Tanker Truck Fire

Ethanol Derailment, Providence RI, 3/8/2017

Photos by Pat Reynolds

No product leaking but a container damage assessment must be completed

Fentanyl

- Synthetic opioid
- Introduced to the medical world as an intravenous analgesic drug in 1959
- The DEA discovers the first domestically produced illicit Fentanyl in 1990's
- 50-100 times more potent than morphine
- 30-50 times more potent than heroin
- Carfentanil (structurally related to fentanyl), is up to 10,000 times more potent than morphine

Source: US DOJ Drug Enforcement Administration, CDC

This amount can kill you

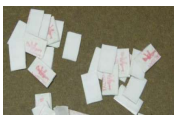
Fentanyl related products have been found in;

Powders

Pill

Capsule

Liquid



Blotter Paper

Source: US DOJ Drug Enforcement Administration, CDC

Recommendations for First Responders

Remember: **Fentanyl** related substances enter the body by all of the following means;

- Oral ingestion
- Contact with mucous membranes
- Inhalation
- Transdermal transmission (through the skin)

Accidental exposure by first responders is a real danger

Source: US DOJ Drug Enforcement Administration, CDC

Fentanyl can be handled safely

- Use your training
- Use the proper equipment
- Include hazard recognition
- Use proper PPE

Canines are also at risk from exposure to **Fentanyl**

Source: US DOJ Drug Enforcement Administration, CDC

Exposed to Fentanyl and Fentanyl-related products

- Symptoms of exposure;
  - Drowsiness, disorientation
  - Sedation, pinpoint pupils, skin rash
  - Clammy skin, respiratory depression or arrest
- Seek medical attention immediately. These substances can be fast acting.

Recommendations if exposed/contaminated by Fentanyl and Fentanyl related materials

- Inhalation; move victim to fresh air
- Ingestion; rinse eyes and mouth with cool water
- Skin contact; wash area immediately with soap and water

"Do **NOT** use hand sanitizers"

Source: US DOJ Drug Enforcement Administration, CDC

Antidote to Fentanyl and Opioid Overdoses

NALOXONE is an antidote for opioid overdose

Immediately administering naloxone can reverse an opioid overdose.

Source: US DOJ Drug Enforcement Administration, CDC

Is that white powder Fentanyl, heroine, or explosives?

Consider a response from the State Haz-Mat Team.

They bring monitoring/identification equipment as well as expertise on PPE and Decontamination.

Regional State Haz-Mat Dispatch at 1-877-385-0822

Situational awareness will help to keep you safe.

Massachusetts Hazmat/CBRNE Incident Response Activation Levels

Tier Response	*Situation*
1- TOMs Unit (ORU Optional) (5 Techs) *Modified Tier 1	Hazard & Risk Assessment or Suspicious Substance Investigation *Air Monitoring at Fire Scenes
2- TOMs Unit & ORU (1/2 the Team)	Short Term Entry Operation
3- TOMs Unit & ORU(s) (Full Team)	Long Term and/or Immediate Life Safety Risk
4- Multi-Team	Major Release or Extended Operation
5- Full Hazmat System, plus Bomb Squad and CST activated	WMD or Mass Casualty Event

Butane Hash Oil (BHO)

Butane Hash Oil (BHO) or Butane Honey Oil (BHO) is an extremely potent concentrate popularly consumed for dabbing and other vaporization methods

Cannabinoids are drawn out of the plant through butane extraction.

Source: leafly.com

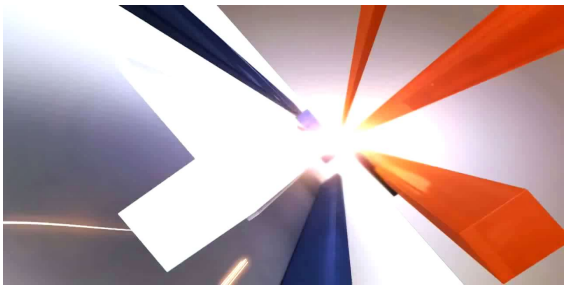
Butane Hash Oil

The problem for First Responders

Flammable butane gas dissolves the THC resin and concentrates it when the butane boils off.

Flammable vapors accumulate low to the ground and find an ignition source.

Source: Todd Burton, Fire Engineering



Butane

Flammable Gas

Definition: Colorless gas with a gasoline like or natural gas odor.
Shipped as a liquefied compressed gas. Liquid below 31˚F

Chemical Formula: C_4H_{10}

Specific Gravity: 0.6 (Liquid at 31˚F)

Vapor Density (RGasD): 2.11

Source: NIOSH Pocket Guide

Butane

LEL: 1.6%

UEL: 8.4%

Expansion Ratio: 233:1

Is expansion Ratio a concern?

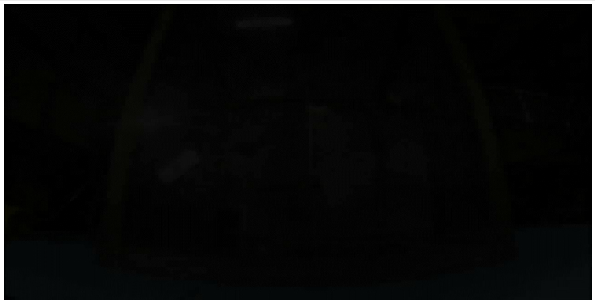
Why?

Source: NIOSH Pocket Guide

Butane Hash Oil

The problem; flammable vapors accumulate low to the ground and find an ignition source.

First responders must not only deal with the flammability issues, but medical issues of victims.

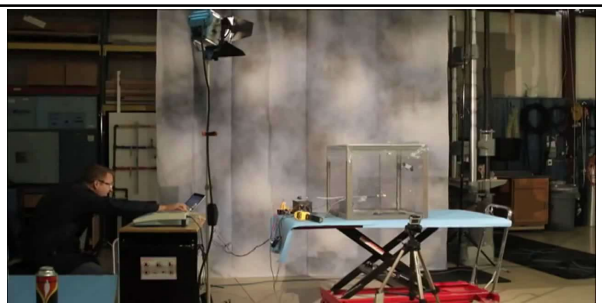


Butane Hash Oil

Safety Considerations

If you find yourself at an incident involving Hash Oil;

- Always wear your PPE
- Use a meter to monitor for LEL



With the "Legalization" of Marijuana in Massachusetts, will this problem be showing up here like it did in Colorado?

Situational awareness and your training will help keep you safe.

Crude Oil

Petroleum that comes from the ground, before refining. Source: Dictionary.com

Bakken Crude Oil

Comes from fracking and horizontal drilling deep in Bakken shale

Bakken Sweet Crude

A light crude, generally used as feed stock and low in hydrogen sulfide

Source: CombatSupportProducts.com

The difference between the following;

Petroleum Products are produced from the processing of crude oil and other liquids at petroleum refineries.

Crude oil is a mixture of hydrocarbons that exist as a liquid in underground geologic formations and remains a liquid when brought to the surface.

Crude oil is divided into three categories; Light, Medium, or Heavy.

- Light Crude is *highly volatile* and highly soluble in water.
- Heavy Crude is a *highly viscus* semi solid and is insoluble in water.

Petroleum is a broad category that includes both crude oil and petroleum products. The term oil and petroleum are often used interchangeably.

Source: www.eia.gov, MASS DEP

Physical properties, ethanol, gasoline and light crude

Property	Ethanol	Gasoline	B. Crude
V. Pressure (mm Hg)	2.3	360	280-360
Flash Point	55 (F)	-50 (F)	-20 (F)
Fuel/air % Ignition	3 – 19%	1 – 8%	+/- 8%
Ignition Temp. (F)	850	495	482
Water Miscible	YES	NO	NO
Safe with water ratio	4 – 5:1	NO	NO
Electrical Conductor	YES	NO	NO
Heat Value (BTU) +/-	11,500	<19,000	<20,000
Smoke Free	YES	NO	NO

Source: CombatSupportProducts.com

Crude oil with high **sulfur content** is referred to as “sour”, while oil with low sulfur content is referred to as “sweet”.

Bakken Crude is generally considered a light-weight sweet petroleum crude and therefore may contain flammable gasses in solution that raise the vapor pressure, lower the flash point, and initial boiling point of the material.

Flammability is the greatest hazard associated with crude oil in a rail incident.

Source; MassDEP

In the event of a spill or leak;

- Eliminate ignition sources. Bond and ground when transferring the product.
- Prevent entry into waterways, sewers, basements, or other confined areas.
- Use vapor suppressing foam to reduce vapors. (Water may not prevent ignition).
- Dike far ahead of the spill.

Source; MassDEP

- Isolate the area and consider evacuations
- Determine the concentrations of any flammable or toxic vapors using air monitoring instruments.
- Evaluate the need for air monitoring specialists (State Haz-Mat).
- Ensure adequate foam supplies and equipment.

Watch for High Hazard Flammable Liquid Training on the Academy's Web Site

Source; MassDEP

Chemical Suicides

History

- The Massachusetts Haz-Mat System has responded to many Hydrogen Sulfide (H_2S), Hydrogen Cyanide (HCN) Chemical Suicide Incidents both in vehicles as well as structures.
- In most cases, the apparent intention is the suicide of a single individual.
- In most cases warning signs have been posted for the protection of others, including first responders.

Indications of a Chemical Suicide

- There may be warning signs placed to alert others.
- With regard to suicide in vehicles, be alert to signs being hidden or obscured by condensation, frost, snow or vapors produced by the reaction.
- Interview anyone who may have approached the scene to learn what they saw or smelled.
  - A "rotten egg" type odor would indicate hydrogen sulfide.
  - An almond odor is typical of cyanide compounds.

Examples of posted signage at actual incidents

Look for indications of a chemical reaction

Typically you will find containers of household chemicals, pails, buckets, pots or other containers where the chemicals were mixed.

WARNING

Caution should be taken to avoid assuming that every chemical suicide is from Hydrogen Sulfide.

Other potential chemicals used in suicides;

- Arsine
- Cyanide
- Phosphine
- Chlorine
- Phosgene
- Carbon Monoxide
- And yes, even Helium

What's been seen in Massachusetts

- Vehicle interior 6-12 hours after mix was 180 ppm of H_2S (Amherst)
- Apartment interior 4 hours after mix and vent (Near Container) was 50ppm (N.Hampton)
  - Hydrogen Sulfide is a very persistent gas with an IDLH of 100ppm

Viable victims have been found due to "larger" area environments

Call Haz-Mat and Law Enforcement

Regional State Haz-Mat Dispatch at 1-877-385-0822

Illicit Laboratory's

- Drug/Meth/Hash Oil
- Explosives
- Chemical, Biological Weapons
- Others that are not within the scope of this refresher training; GHB, MDMA (Ecstasy)

There is not enough time in this refresher to cover all of the types of labs out there but we will share clues.

How many of these labs are discovered

- Fires
- EMS Calls
- Complaints of; Odors, Trash/waste, Trespassers
- Law Enforcement
- Burn Victims.

External Illicit Lab Indicators

- Bars or covers on windows
- Chemical odors/vapors clouds, abnormal accumulation of trash
- Dead animals/birds, and vegetation in the vicinity
- Security;
  - Extra Locks
  - Fortified doors
  - Guards (dogs, snakes, humans)
  - Surveillance cameras

Does this look like it belongs here

What kind of lab is it?

Explosive

Bacterial Agent

Chemical

New Generation of Meth Lab

The "One Pot/Shake and Bake" Method

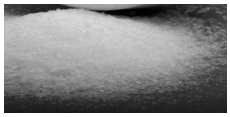
Some cooks will place the container outdoors, abandon it, and return later to determine if it was a successful cook.

First Responders must use **CAUTION**

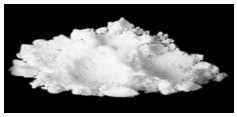
Can you identify these products?

Heroin

Recrystallized Meth



TATP



HMTP

Situational awareness, training, and common sense is the key to your safety and healthy longevity