

Firefighting Foam & Flammable Liquids (Revision 4/20/2011 – Swannanoa Fire Department)

Name _____ Date _____

Class 1 Flammable liquids have a flashpoint below _____ °F

Gasoline has a flashpoint of ____°F, while Jet A has a flashpoint of just less than _____°F

List two fuels that have flashpoints below an average temperature day. (In other words the fuels can “flash” on any givenday) _____

List two fuels which would NOT “flash” on an average day

A product with a vapor density of 1.2 would (Rise or Sink) _____ in air.

Fuel vapors from gasoline are Heavier Lighter than air and therefore will seek Higher Lower ground

If a product has an LFL of 1.4% and the product is at 1.3%, it (Will Will not) ignite because the mixture is (Too rich, Too Lean, Within the Flammable Range).

According to the chart (Without acetylene), Which product has the widest Flammable Range and therefore the highest danger related to flammable ranges. _____

Flammable liquids such as gasoline, diesel and several other products have a Higher Lower specific gravity than water (Salt or Fresh) and therefore will Float Sink

Some products like ethanol are miscible with water meaning the ability of a liquid to _____ in all proportions (totally).

Any disruption of the fuel’s surface increases surface area available to release vapors. While any water stream can increase fire activity, solid streams _____ into the liquid will cause a dramatic increase.

A hydrocarbon’s characteristic is a lack of affinity (_____) with water.

Match the Hydrocarbons

Flammable liquid	Hydrocarbon family
A. benzene, toluene	___ Light hydrocarbons
B. gasoline, heptane, cyclohexane, terpene	___ Heavy hydrocarbons
C. fuel-oil, diesel, kerosene	___ Aromatic hydrocarbons

One Polar Solvent characteristic is the affinity for water (*They mix _____ with it*).

Methanol is in the _____ group of Polar Solvents.

Foam is still made up of a lot of water so polar solvents can “blend” with the water in foam and _____ its structure.

True or False 87 & 89 octane gasoline uses a typical class B rated foam concentrate but 91 & higher require an alcohol resistant foam concentrate.

Octane ratings (relate do not relate) to the energy content of the fuel.

Fuels such as E-85 contain ___% ethanol/ ___% hydrocarbon fuel such as gasoline.

E-10 is ___%ethanol / ___% gasoline.

To give an indication of an increase in Flex-Fuel (Which can run E85) vehicles, by the year 2015, automakers have pledged that ___ percent of their production will meet that capability.

A placard with the numbers "1203" is used for gasoline with an Ethanol mixture up to ___% and uses DOT Guide # 128

E85's placard number is " _____ " and uses guide # _____.

True or False - Diluting Ethanol can easily lower its flashpoint rendering it inflammable.

Why are underflow dams not effective with Ethanol?

"Pure or highly concentrated Ethanol (E85) may _____ living tissue on contact."

True or False - Since E85 is an environmentally friendly fuel, spills into streams, rivers or ponds will not cause harm to aquatic life.

Biodeisel blend (B20) is a blend of 20% biodiesel fuel, and 80% _____.

True or False - Since biodeisel, E85 other newer fuels are referred to as "Clean Energy" or "Clean Fuels, use of an SCBA is not required.

List 2 products that you will likely find stored for the production of biodiesel.

While glycerin does not have any specific flammability concerns and is used in several safe products, burning of glycerin produces " _____." Concentrations of 2 ppm are immediately harmful and a suspected human _____.

B _____ **L** _____ **E** _____ **V** _____ **E** _____

A _____ **F** _____ **F** _____ **F** _____

AFFF works by creating a _____ that stays on top of the flammable liquid to _____ vapors and a foam substance that helps cooling, insulates and separates other ignition sources or hostile fire from reigniting the vapors.

True or False Our Class A/B foam can be used on Class A fires and Class B fires such as gasoline.

List three basic factors we use to choose foam product.

The shelf life of our foam, in a sealed bucket, is _____ years.




What is in the buckets is referred to as foam _____

Mixed with water it is called foam _____

When both are mixed with air, it is called _____

The nozzle selection we use produces a ___ expansion foam

An eductor should be flushed with clean water for at least ___ minutes

Location	(Engine 63)	(Ladder 6)	(On Engine 61)
Image			 <i>(newer model in graphic)</i>
Model	Akron 3072	Elkhart Model 241	Akron 2958
Type	<input type="checkbox"/> In-Line <input type="checkbox"/> By-Pass	<input type="checkbox"/> In-Line <input type="checkbox"/> By-Pass	<input type="checkbox"/> In-Line <input type="checkbox"/> By-Pass
Psi/Gpm	<input type="checkbox"/> 150 <input type="checkbox"/> 200 <input type="checkbox"/> 250	<input type="checkbox"/> 150 <input type="checkbox"/> 200 <input type="checkbox"/> 250	<input type="checkbox"/> 150 <input type="checkbox"/> 200 <input type="checkbox"/> 250
GPM	<input type="checkbox"/> 95 <input type="checkbox"/> 125 <input type="checkbox"/> 150	<input type="checkbox"/> 95 <input type="checkbox"/> 125 <input type="checkbox"/> 150	<input type="checkbox"/> 95 <input type="checkbox"/> 125 <input type="checkbox"/> 150
Location	<input type="checkbox"/> E61 <input type="checkbox"/> E62 <input type="checkbox"/> E63 <input type="checkbox"/> L6	<input type="checkbox"/> E61 <input type="checkbox"/> E62 <input type="checkbox"/> E63 <input type="checkbox"/> L6	<input type="checkbox"/> E61 <input type="checkbox"/> E62 <input type="checkbox"/> E63 <input type="checkbox"/> L6

On Engine 62, the control head can be set to inject various percentage rates such as the _____% required for flammable liquid fires.

Engine 62's foam tank and system can only be used on flammable liquid fires if the Class ___/___ foam concentrate product is used.

True or False If the compressor on E62 fails, it is impossible to make foam with the apparatus.

List three things that break down finished foam.

The smoothbore is _____ effective when using an eductor setup, and _____ effective when using CAFS.

It is important to remember that application rates that are below recommendations may simply be a waste of foam concentrate and effort... you may need to _____ attack until sufficient concentrate and _____ resources are on scene and ready.

_____ rate is how much foam solution is applied in a specified time.

Name the 5 basic considerations that will dictate this rate:

1. _____
2. _____
3. _____
4. _____
5. _____

Print and use the SVFD Quick Reference Guide:

In judging square feet involved, what are the following areas?

Crosslay by Crosslay = _____ FT²

Crosslay by a yardstick (Like a long spill or fire)= _____ FT²

Application rates will remain the same for hydrocarbon fuels (at _____ gpm foam solution per square foot).

Polar solvents generally require a minimum _____gpm foam solution per square foot and certain polar solvents may require applications rates up to _____gpm per square foot.

A minimum ____ minute application time is used per NFPA11.

Practice with Basic Calculations – You may use a calculator but you also must show your math problem in the box

A hydrocarbon fire has occurred covering an area of 3,500Ft²:

Show your math here:

How much FOAM SOLUTION is needed per minute? _____

What is the total amount of foam solution that all 3 of SVFD's eductors (E63,61 & L6) can produce?

Do we have enough to complete this task? Yes or No

A hydrocarbon fire has occurred covering an area of 1,600Ft²:

Show your math here:

How many gallons of FOAM CONCENTRATE are needed for the 15 minute period? _____

This is how many pails of foam concentrate? _____

An E85 spill with fire has occurred covering an area of 1,600Ft²:

Show your math here:

How many gallons of FOAM CONCENTRATE are needed for the 15 minute period? _____

This is how many pails of foam concentrate? _____

To suppress a 80Ft² hydrocarbon fire you would need an ____B rated extinguisher.

The eductor requires _____psi.

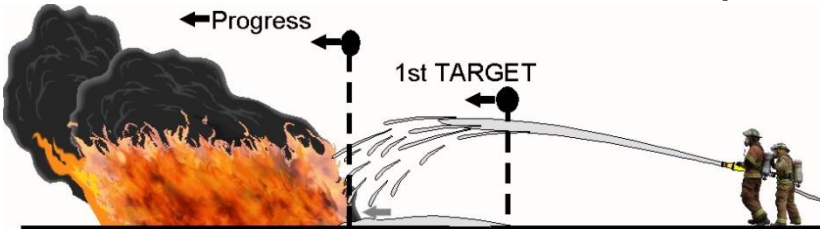
For Ladder 6 and Engine 63's eductors, you can account for appx ____psi of friction loss per 100' of hose before the eductor.

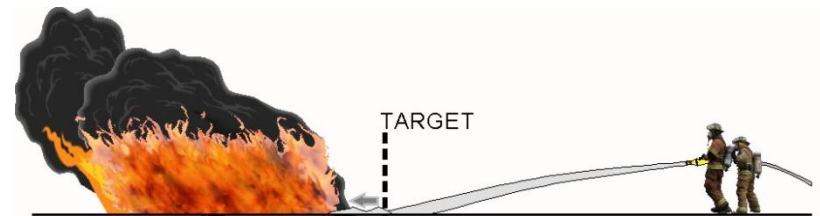
Improperly worn _____ does not protect you

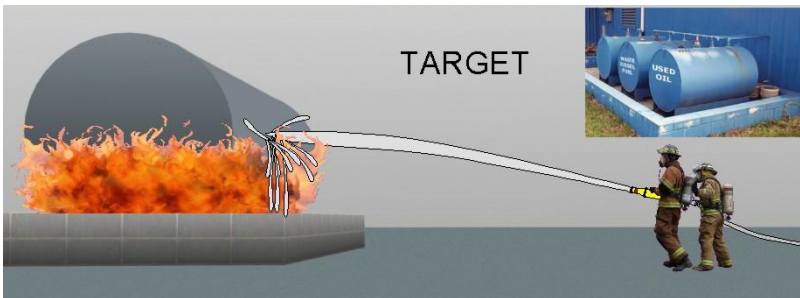
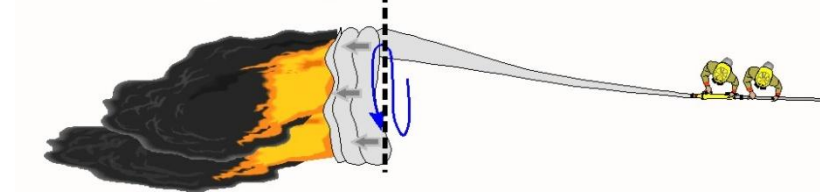
True or False If an instructor at a fire school is wanting you to attack a flammable liquid fire with a foam line and not wear an SCBA, you should follow their orders and discuss it when you return from the school.

“The more _____ the foam is applied, the more _____ the extinguishment and the _____ the total amount of agent required.”

Label the techniques of application







- R - _____
- E - _____
- C - _____
- E - _____
- O - _____
- V - _____
- S - _____

If a foam blanket is being applied it will be in the _____ zone.

Do not set up operations in the path of flowing or _____ flowing flammable liquids

A flammable liquid fire, spill or areas that will be affected by radiant heat, a blast radius etc,.... Will be included in the _____ zone.

List some criteria as to when the attack crew should be protected with a foam backup line.

On the issue of “bucket management”, think of the process of an _____ line., Be systematic.