

**SOLBERG**

*The new standard in firefighting foam technology — worldwide*

# *Next Generation Firefighting Foam Technology*

Mark Wise  
Southern Regional Manager



*An Amerex Corporation Company*



For Generations



## ***Solberg – Global Established Brand***

**1978** - National Foam Distributor Europe

**1981**- Manufactured for National Foam to supply Europe

**1989** – License agreement with 3M to manufacture 3M Light Water for European market

**2001** – Launched fluorine free foam

**2007** – Acquired patents, intellectual property for 3M fluorine free foam formulation

**2011** – Amerex acquires majority shares of Solberg and opens US based operations

# ***Global Operations***



**Green Bay, WI**



**Bergen, Norway**



**Sydney, Australia**

# Solberg - What We Do...

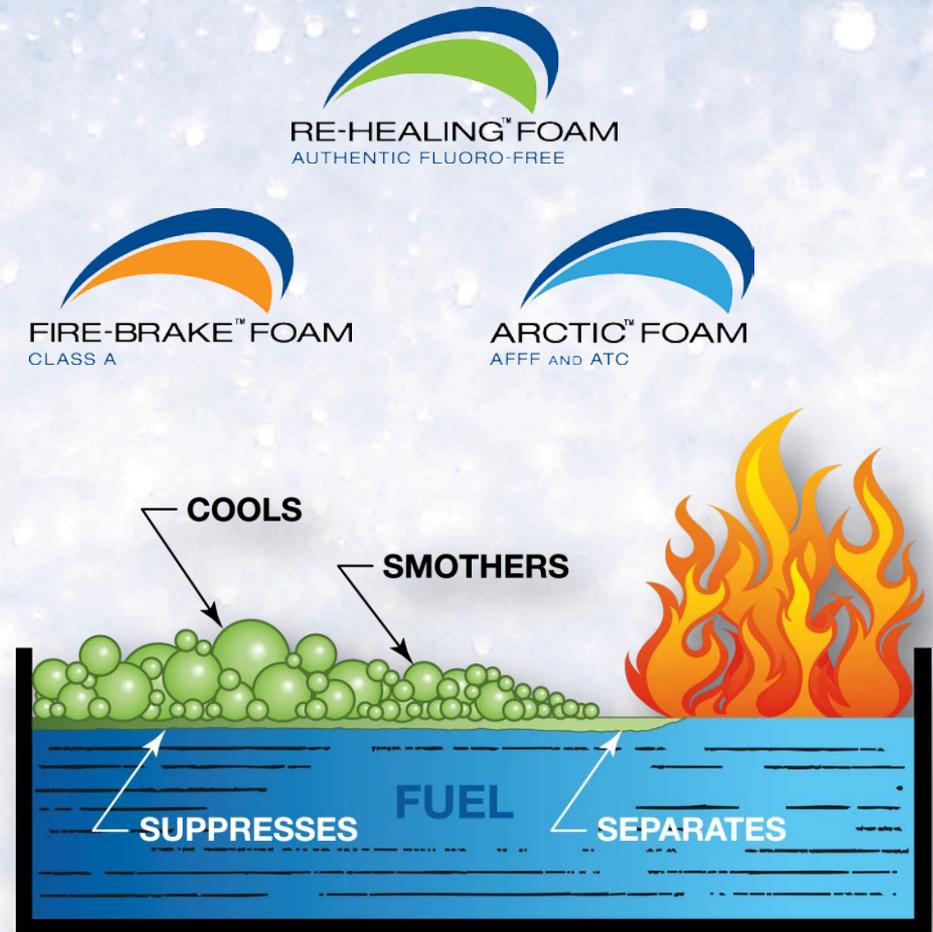


## •FOAM CONCENTRATES

- Authentic Fluoro-Free
- AFFF's
- AR-AFFF's
- Synthetic Detergent
- Class "A"
- Specialty Concentrates

## •SERVICES

- Analysis & Testing



# Solberg - What We Do...



## •FOAM HARDWARE

### • System Tanks

- Bladder Tanks (Inc. pre-piped)
- Atmospheric
- Pump Skids

### • Proportioning Devices

- Ratio Controllers
- Variable Range Proportioner

### • Discharge Devices

- Foam Chambers, Foam Makers

### • Mobile Products

- Foam Carts
- Foam Trailers

### • Specialized Equipment / Services



# *Americas Facility*

**Two Buildings**

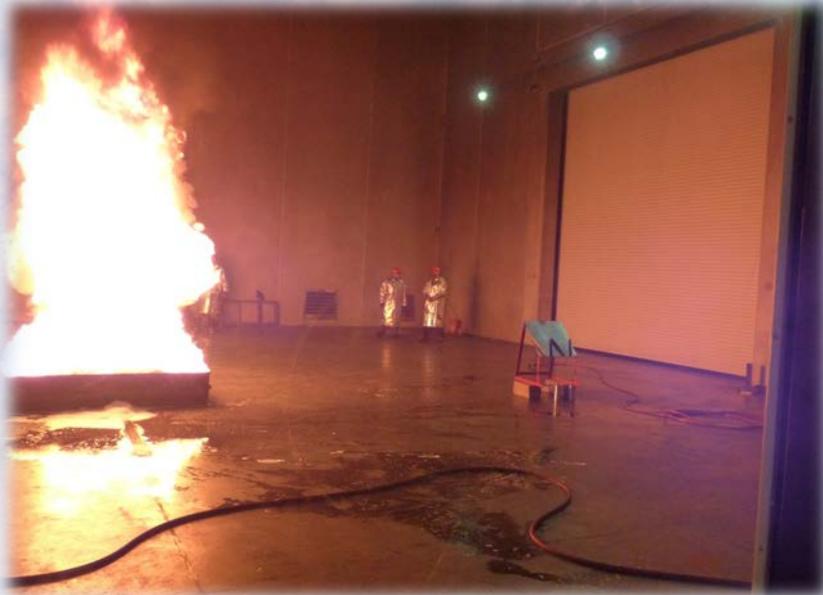
**20,750 Total Square Foot (1928 m<sup>2</sup>)**

**Mfg./Warehouse/Office – 16,650 ft<sup>2</sup> (1547 m<sup>2</sup>)**

**Fire Test Laboratory - 4100 ft<sup>2</sup> (381 m<sup>2</sup>) - 64ft high (20 m )**



# ***Fire Test Laboratory***



Fire test certification laboratory



# Evolution of Firefighting Foam



Environmentally  
Safe Foams  
2005

Fluoroprotein  
1965

Synthetic AFFF  
1963

Protein  
1933

Chemical  
1915 - 1933



# *Fire Fighting Foam Advancements The Next Generation*



# *Next Generation Firefighting Foam Technology*



## *Fluoro Compound Free Firefighting Foam*



RE-HEALING™ FOAM  
AUTHENTIC FLUORO-FREE



# Next Generation Fire Fighting Foam Technology

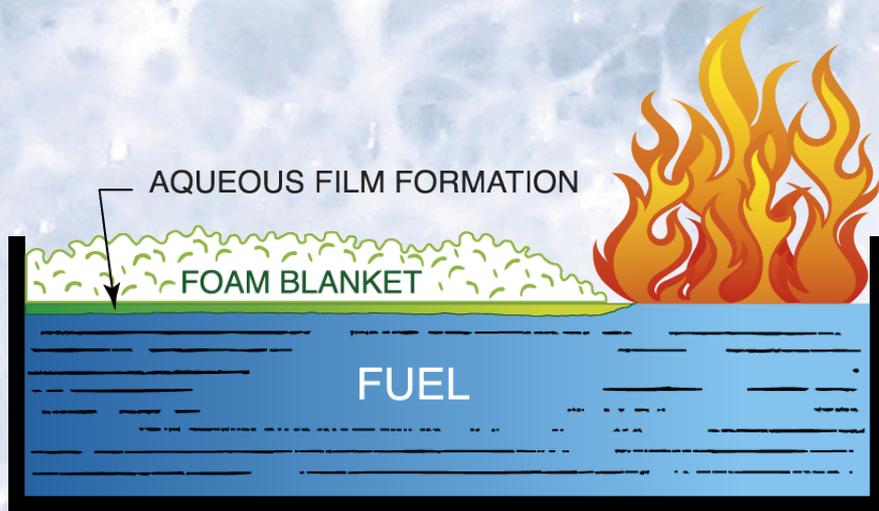


## Solberg RE-HEALING™ Foam (RF)



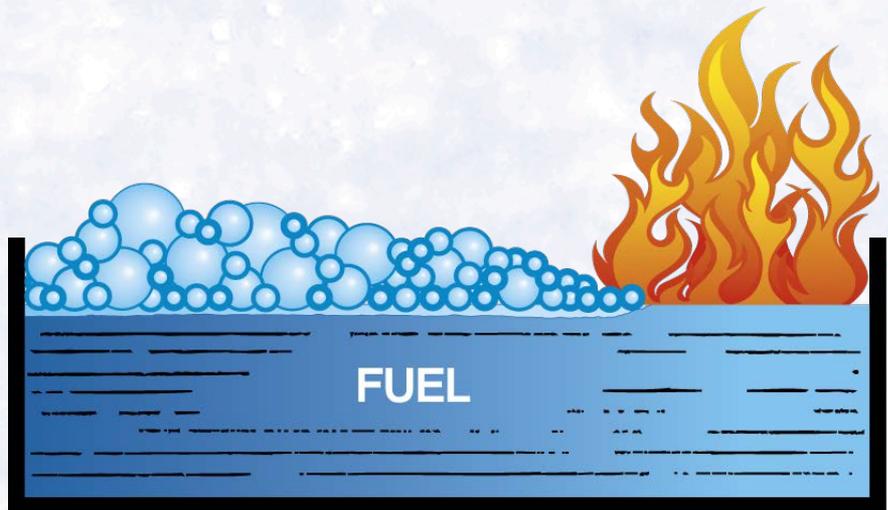
- **100% Fluorine Free and Fluoro Compound Free**
- High performance fire fighting foam without the use of any fluorine or fluoro compounds
- RF-3 RE-HEALING™ Foam has successfully passed UL 162 Fire Testing UL File Number **GFGV.EX15969**
- RF-6 RE-HEALING™ Foam is UL Listed
- RF 3x3 RE-HEALING™ RF 3x3 ATC™ available 2014
- Developed from complex carbohydrates using hydrocarbon surfactants to create a fluid and stable foam bubble structure

# How RE-HEALING FOAM™ Works



**RF Concentrates**

**AFFF Concentrates**

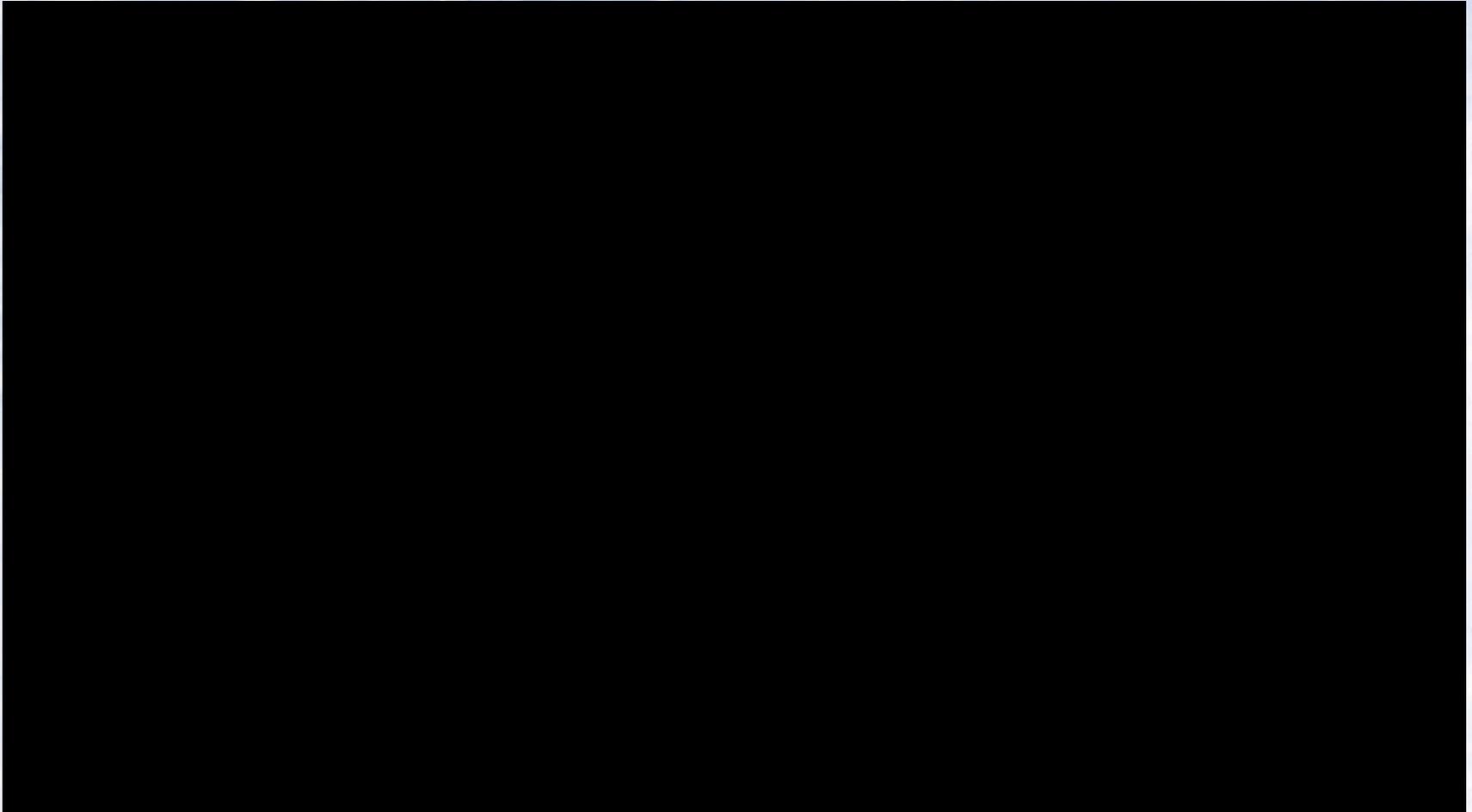


***Advancements in Firefighting Foam  
Technologies***

***UL 162 Fire Test***

***Solberg Fire Test Facility Bergen Norway***

# ***RF-6 Fire Test Bergen Norway***



# Foam Terminology

- **QUARTER DRAIN TIME:**
  - Also known as 25% drain time
  - Time required for 25% of the total liquid solution to drain from the foam considered to render the foam ineffective

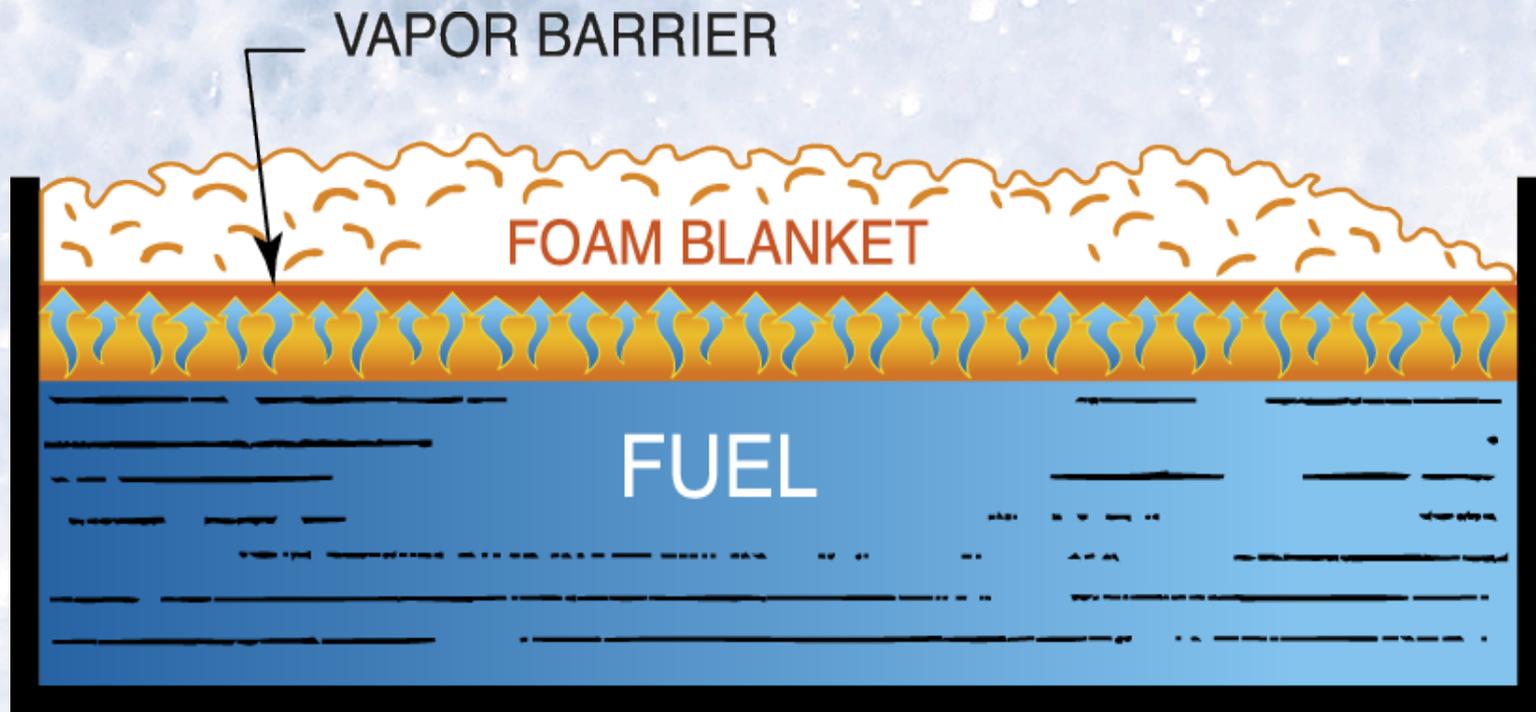


## ***RF Fire Test Results***

### UL 162 Fire Test Heptane

	<b>Extinguishment Time</b>	<b>Foam Expansion Factor</b>	<b>25% Drain Time</b>
<b>RE-HEALING RF3</b>	<b>1:30</b>	<b>3.7/1 – 8.7/1</b>	<b>30-75 min</b>

## *Re-Healing Foam Vapor Suppressing advantage*



Based upon UL-162 foam expansion and drain time measurement  
RF Foam 25% drain times are up to 5 times longer reducing the  
need to re-apply foam for vapor suppression

# Discharge Devices

## Sprinklers

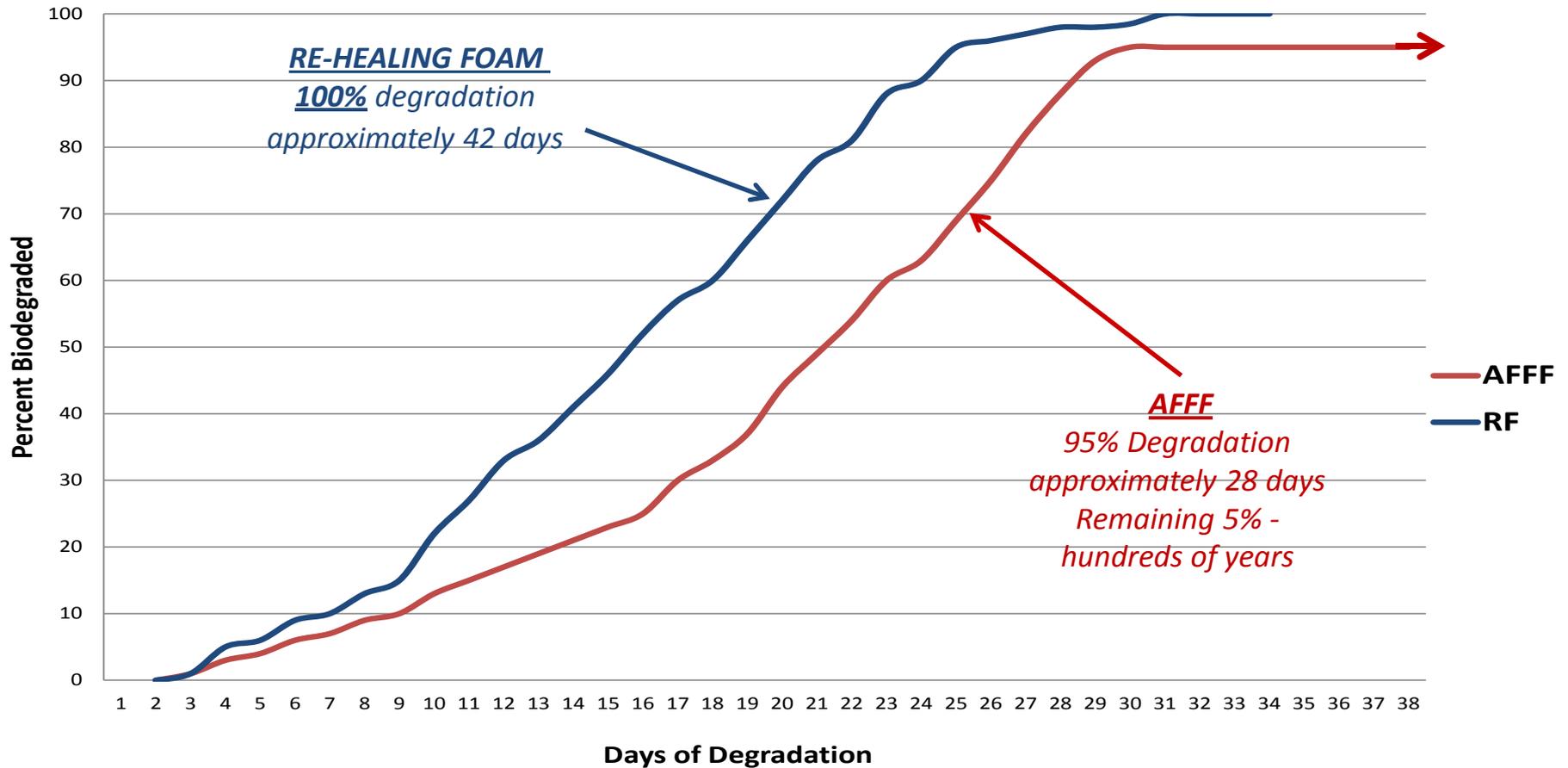
- UL listed sprinklers with Re-Healing and Arctic AFFF foam concentrates
- Non-air aspirated sprinkler heads
- Air aspirated sprinklers
- UL Testing **Reliable** sprinklers
  - Model G – 5.6 & 8.0
  - Model F1 – 8.0
  - Model F156 – 5.6
  - HV & MV Spray Nozzles
    - Tyco B-1 Aspirated head

**Reliable**



# Rate of Bio-Degradation

## Long Term Degradation



# *Next Generation Firefighting Foam Technology*



## *Advancements in Technology*

- The best environmental solution available
- 100% fluorine free
- UL Listed, EN Approved, meets Lastfire performance testing
- Does not compromise firefighting performance

*Next Generation Firefighting  
Foam Technology*



**RE-HEALING™ FOAM**  
AUTHENTIC FLUORO-FREE

## ***AFFF – Environmental Legacy***

- **Fluorosurfactants are “the” active ingredient in AFFF’s**
- **Fluorosurfactants are Perfluorinated Chemicals (PFC’s)**
- **May 2002 – 3M exits the firefighting foam market**
  - 3M Utilized Electrochemical Fluorination (ECF) Manufacturing Process which was identified to create PFOS
  - 3M Fluorosurfactants identified as Persistent, Bioaccumulative, & Toxic (PBT)
  - Potential groundwater contamination
  - PFOS found to be present in the blood of the general population
  - PFOS identified to affect the blood and immune system in laboratory animal

# *Global Environmental Legislation*



- **European Union**
  - 2010 EU-POP (European Union – Persistent Organic Pollutants Regulation)
    - Production, supply and use are now banned with some exemptions
    - PFOS-containing foam stocks must be managed as a hazardous waste
- **Canada**
  - Canadian Environmental Protection Act
    - Starting June 2013 production, supply and use are banned (military exempt)
    - PFOS is specified on the List of Toxic Substances
- **United States Environmental Protection Agency**
  - Current Regulations ban production of PFOS products
    - PFOS stocks not restricted from use
    - Currently not considered as hazardous waste

- **USEPA Concerns with PFOA (C<sub>8</sub>)**
  - Perfluorooctanoic acid (PFOA) is a long-chain chemical that does not occur naturally in the environment
  - PFOA is very persistent in the environment
  - PFOA has been found at very low levels in the blood of the general U.S. population.
  - January 26, 2006 announced the “2010/2015 PFOA Stewardship Program,”
    - All major surfactant manufactures have agreed to comply with two goals





**SOLBERG**

# ***Reformulating to Environmentally Improved AFFF?***

## ***Changing C<sub>8</sub> Chemistry***

- Fluorinated surfactants are the key component for AFFF performance
- Changing from C<sub>8</sub> to C<sub>6</sub> formulations provides for improved environmental profile with shorter chain molecule
- Formulation chemists are faced with two options
  - Accept a lesser performing AFFF product
  - Increase quantity of surfactant to produce equal performance
- Increased surfactant results in significant cost increase in product
- UL recertification testing will be required

# Solberg AFFF Foam Agents

## ARCTIC Foam

- AFFF formulation
- 1%, 3%

**Hydrocarbon Fuel Only**

## ARCTIC Foam

- AR-AFFF formulation
- 1X3 ATC™
- 3X3 ATC™

**Hydrocarbon Fuel and Polar Solvent Fuels**

## ARCTIC Foam

- AR-AFFF formulation
- 3X6 ATC™

**Hydrocarbon Fuel and Polar Solvent Fuels**



*Solberg is a global company that is a one-stop resource for firefighting foam concentrates and custom-designed foam suppression systems hardware, offering both traditional and innovative firefighting foam technology. [www.solbergfoam.com](http://www.solbergfoam.com)*



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