# Aircraft Rescue and Fire Fighting Foam

CTIF Airport Commission

June 2011

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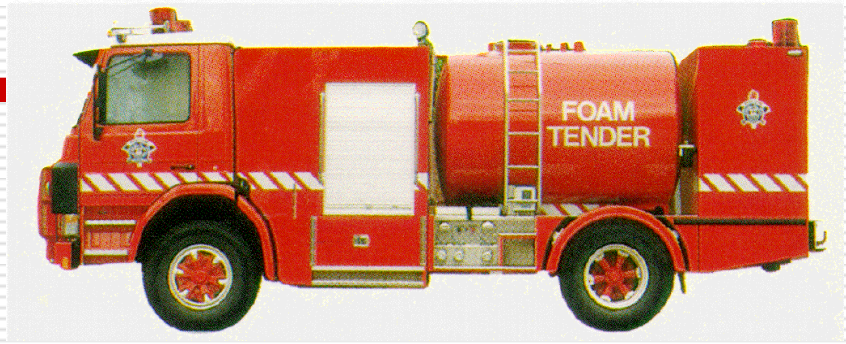
# Agenda




- The International operational regulations and standards
- The Users Quality Assurance issues
- The Environmental and Health requirements
- Current R&D efforts new products

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# What standards and guidelines to use?

First consideration

-Your own jurisdiction regulations

-ICAO SARPs

Secondary consideration

-Expectation from your Management

-Expectation from stakeholders

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# International Guidelines and Standards

INTERNATIONAL CIVIL AVIATION ORGANIZATION

HEADQUARTERS : MONTRÉAL, CANADA

ICAO Regional Offices:
Bangkok, Cairo, Dakar, Lima, Mexico City, Nairobi, Paris

ISO International Organization for Standardization

BSI

UL the standard in safety

cen European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

DIN

NFPA National Fire Protection Association
The authority on fire, electrical, and building safety

# On-going quality assurance

Regular Third Party evaluation process which measures the performance of the foam against published aims and objectives to ensure that these are being fulfilled.

Record keeping

- Baseline from Manufacturing and Third Party tests
- At regular interval

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# The Foam concentrate

- The concentrate requirements
  - ICAO airport service manual Part 1
  - Level A and B (C pending)
  - US Military specs
  - Other Standards
- The product quality assurance
  - You
  - The manufacturer
  - Accredited laboratory

# TYPES OF FOAMS

PROTEIN
FLUOROPROTEIN
AFFF
AR-AFFF
Re-Healing Foams
HI - EX
CLASS “A”

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# ALL FOAMS EXTINGUISH FIRE IN FOUR WAYS

1. SMOTHERING THE FIRE
2. SUPPRESSING FLAMMABLE VAPOURS
3. SEPARATE FLAMES/IGNITION SOURCE
4. COOL FUEL AND ADJACENT SURFACES

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# FOAM SYSTEM INGREDIENTS

- 1. WATER SUPPLY
- 2. PROPORTIONER
- 3. FOAM MAKER
- 4. FOAM CONCENTRATE

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# The Foam Test

- Foam
  - The product quality assurance
  - The concentrate requirements

- Vehicles
  - Vehicle discharge rate
  - Foam expansion
  - Foam proportionning
  - Foam 25% drainage time

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# ARFF vehicles Fleet Management

- Regulatory compliance
  - In service targets
    - Maintenance downtime
    - Testing downtime
  - Environment
  - Business resumtion
    - Spare vehicles
    - Larger vehicles

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# The RFF Vehicle Tests

- Vehicle discharge rate
  - Manufacturer specifications
  - Your test records
  - The CARs/ICAO table requirement
- Foam expansion
  - The difference between liquid weight and foam bubbles
- Foam proportionning
  - The ratio of foam concentrate in the water
  - Example 6 parts foam 94 parts water 6%
  - Measured by making a calibration graph
    (Practical excercise with meter)
- Foam 25% drainage time
  - Time for 25% of the foam to liquefy (practical demonstration)
- Foam discharge pattern (example drawing)

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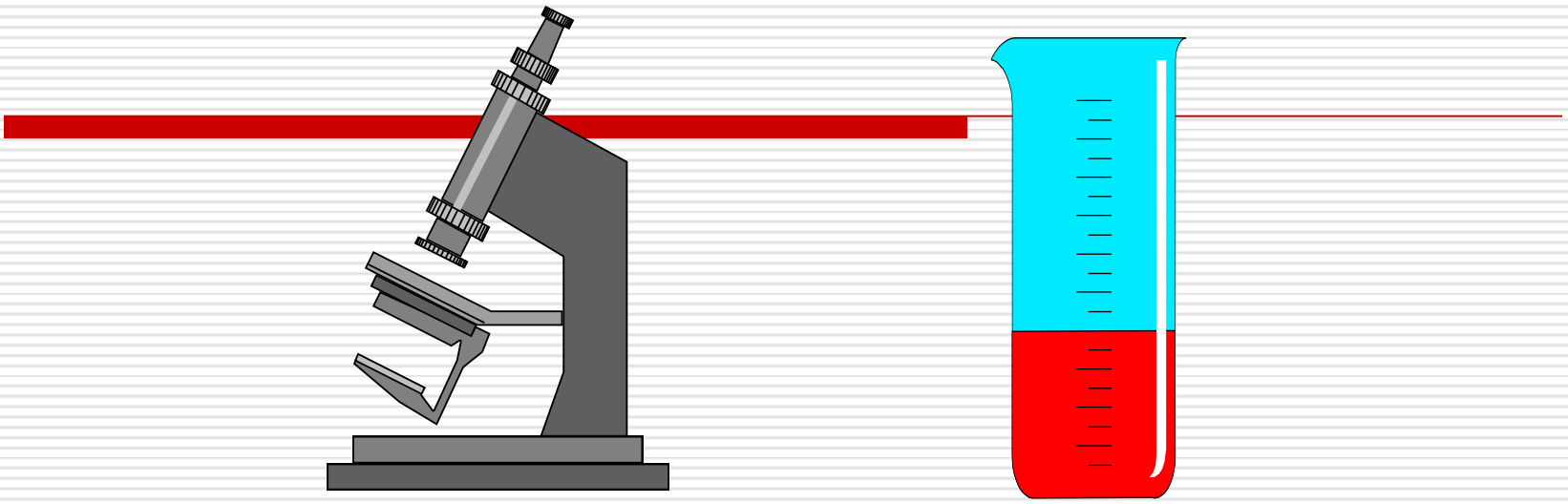
# FOAM EXPANSION



The rate between the value of foam produced and the volume of solution used in its production.

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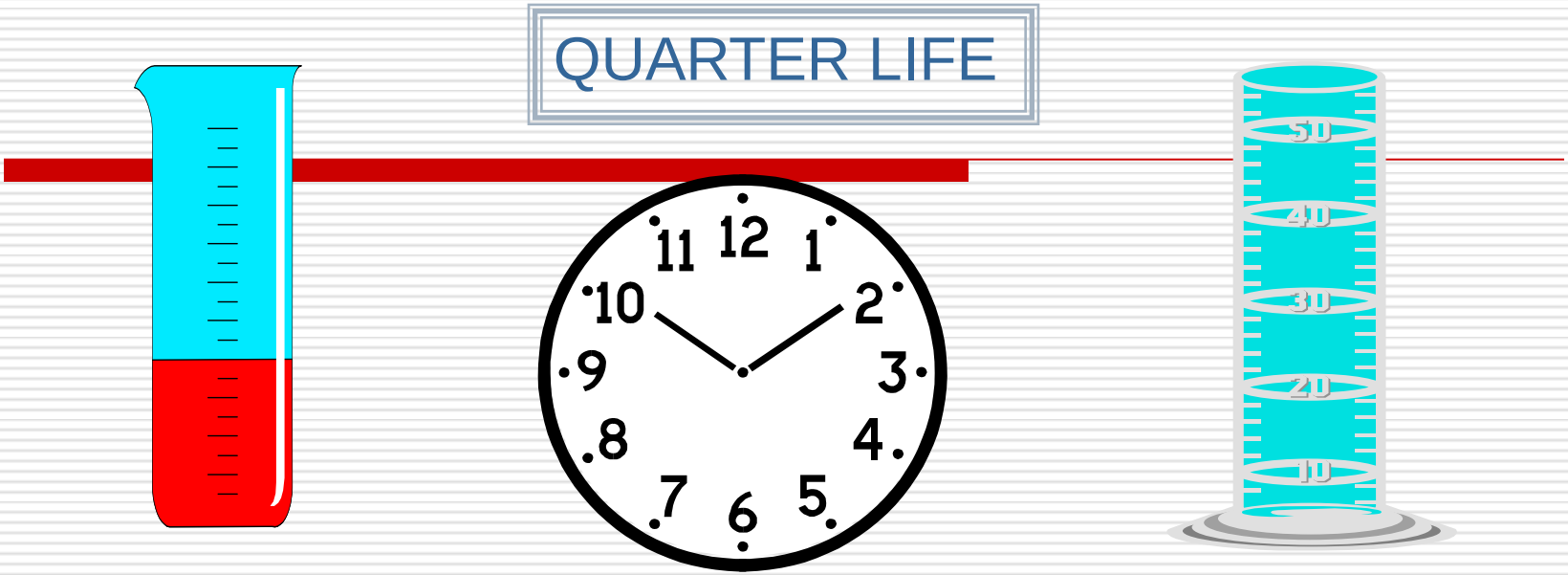
# FOAM DRAINAGE TIME




The time that it takes for 25% of the total liquid contained in the FOAM SAMPLE to drain out of the FOAM.

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# Tolerances

## For nominal 6% concentrates

*The concentration shall be between **5.5%** and **7.0%** for the turret and ground sweep nozzles, and between **5.5 and 8.0%** for handline(s) and undertruck nozzles.*

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# Tolerances

## For nominal 3 % concentrates

*The concentration shall be between **2.8%** and **3.5%** for the turret and, between **2.8 and 4.0%** for handline(s)*

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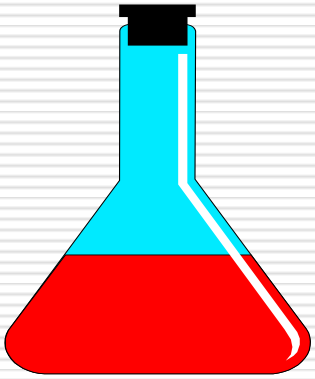
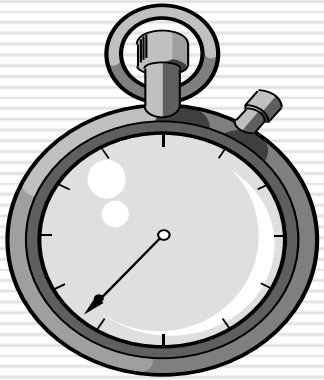
# MINIMUM ACCEPTABLE REQUIREMENTS

## ( AIR - ASPIRATED) FOAM





**The minimum Expansion Ratio shall be 5:1 with a minimum solution 25% ainage time of 3 minutes.**

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# The Environmental and Health requirements

- PFOS elimination
- Fluorocarbons
- Controled discharge
- Operational understanding

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# Current R&D efforts/New products

- ICAO level C
  - Same environemental limitations as AFFF
  - Savings may be of short duration
  - Revision of the ICAO levels A and B tests
  - Opportunity to upgrade to the largest AC
  - Update being challenged by commission

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# Current R&D efforts/New products

- Compressed air foam
- Environmental classification system
  - *CAA projects (Simon WeB)*
- Australia adoption of Fluorine free foams for all their operation
  - Air Services Australia RFF

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# Thank You

- Questions?

- Bernard Valois