

SOLBERG
SCANDINAVIAN



RE-HEALING FOAM™
by SOLBERG

- Initial R&D started 2001 (3M)
- Co-operation SOLBERG with 3M Australia 2002
- First Sales 2003
- SOLBERG doing the test work for EN 1568 & LASTFIRE
- Full owner of Patent and all NON AFFF based Intellectual property 2007
- 2007 First major Order (180 000 Liter)
- 2008 First Major AIRPORT (Kastrup Copenhagen, DK)
- 2008 Continuous Improvement Program + REACH

SOLBERG
SCANDINAVIAN

RE-HEALING FOAMS™

Containing no Organo-Halogens

No PBT issue



Concentrates available for:

- Hydrocarbon
- Hydrocarbon + polar solvents

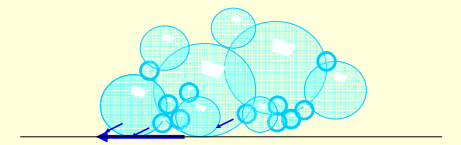
Approvals:

- En 1568 part 3 and 4
- ICAO – B
- Lastfire

WWW.SOLBERGFOAMS.COM

SOLBERG
SCANDINAVIAN

Working of RE-HEALING FOAM



- Round bubbles of different sizes
- Easy to foam
- Bigger bubbles collapse to water film which has very short life time but will spread the smaller one's over the surface.
- Smaller bubbles have stronger walls and long draintime and good bumback resistance

WWW.SOLBERGFOAMS.COM

SOLBERG
SCANDINAVIAN

Low expansion with Re-Healing Foam



WWW.SOLBERGFOAMS.COM

SOLBERG
SCANDINAVIAN

Test RF Foam with Williams nozzle (NZ)



WWW.SOLBERGFOAMS.COM

SOLBERG
SCANDINAVIAN

EXXON – MOBIL Antwerp



BIG GUNS
Non-Aspirated Equipment!

WWW.SOLBERGFOAMS.COM

SOLBERG SCANDINAVIAN

Longford Fire Trials (AUS)

WWW.ARCTICFOAM.COM

SOLBERG SCANDINAVIAN

Documents:

- Product information sheets
- MSDS's No R No S codes
- Hygiene Institute dilution 1:15 (6% conc.)
- EN approvals 1568 part 3 1B part 4 1A
- Last Fire test
- **ICAO test reports / Film**
- Test rapports on Ethanol and Bio Diesel
- Gesip tests(Fr) on Ethanol
- Technical information: Bulletins
- References

WWW.SOLBERGFOAMS.COM

SOLBERG SCANDINAVIAN

Lastfire batch test BP

- Tests with sea- and tap water.
- Tests with semi aspirating, aspirating and system nozzle
- Max points /test=100

Testresults RF3x6ATC according LASTFIRE protocol

March 2008

	Semi-Aspirating	Aspirating	System
Tap water	100	100	100
Sea water	85	100	85

WWW.ARCTICFOAM.COM



ICAO LEVEL B / AVIATION applications

- ICAO Tested and witnessed
 - Report DNV
 - IAFFA
 - Moving Nozzle Horizontal plane (see Movie)
 - NEW method (fixed Nozzle)
 - BRISTOL AIRPORT
 - SOLBERG !
 - expertise on LEVEL C: 3% AFFF, THE only one PASS of 28 samples
- Snozzle
- Waterspray Nozzle (Non-Aspirated)
- CAFS
- Other BENEFITS
 - Compatible POWDER
 - Sticky to HOT METAL
 - LOWER TOXIC release flammable material



WWW.SOLBERGFOAMS.COM



PAPERS

- Australasian Fire Authorities Conference 2002 Conference Proceedings CD Abstracts Volume pg 48 (September 2002)
Class B Foams...Is It Time To Innovate? *Ted H. Schaefer*
 - All modern class B fire fighting foams contain fluorosurfactants. If fluorosurfactants are no longer environmentally acceptable, then a sustainable alternative chemistry must be found. 3M Australia has innovated and developed a sustainable chemistry to act as an AFFF alternative. The 3M RF series of foams are 100% biodegradable. RF6 is the first product of this series and it meets the highest standards of the aviation industry with an ICAO level B performance.
- IAFFA Aviation Fire Asia 2003 Conf. Singapore (October 2003):
NEW NON-FLUOROSURFACTANT BASED FORMULATION FOR REPLACEMENT OF CLASS B FOAMS.
Ted H. Schaefer, Bogdan Z. Dlugogorski and Eric M. Kennedy
 - A fire ground demonstration confirmed that the new Re-Healing foam technology works well if applied by an ARFF vehicle through turrets and handlines. Calibration testing confirmed accurate proportioning of foam concentrate for use in both devices.
- IAFFA Sydney 2005 Conference Proceedings October 5-7, 2005:
NEW FOAM TECHNOLOGY, NEW FOUND BENEFITS.
Ted H. Schaefer, Bogdan Z. Dlugogorski and Eric M. Kennedy
 - RF foam technology has been shown to have the ability to create a residual barrier after the foam has completely drained and collapsed.

WWW.ARCTICFOAM.COM



References




- Total Refinery The Netherlands
- Lilly Kinsale Plant Ireland
- New Zealand refinery New Zealand
- BP/Petroplus UK
- BASF Malaysia
- Pfizer Ireland Pharmaceutical Ireland
- EXXON - MOBIL Australia
- STAOILHYDRO Norway
- Bayern Oil Germany
- Vesttank Norway
- RAFNES / BOREALIS Norway
- KASTRUP Airport (Copenhagen) Denmark
- EXXON - MOBIL UK
- Several Fire Brigades, Airports EU, M.E., APAC
- ...


WWW.SOLBERGFOAMS.COM

SOLBERG SCANDINAVIAN

Reliable



- All batches are fire tested on own fire test area



- Customer will receive Certificate of Analysis (COA)

RE-HEALING FOAM™
by SOLBERG

WWW.SOLBERGFOAMS.COM

SOLBERG SCANDINAVIAN

Future (or good environmental behaviour)

2 options:

- Continue the use of AFFF or FFFP foams.
 - Collect
 - Treat
 - Transport and burn because it contains OrganoHalogens

•Volume will increase 100/6 to 100/1 times

ALTERNATIVELY

- Use a high performance approved foam, which degrades to natural occurring compounds: RF 3, RF 6 or RF3X6 ATC approved to the most stringent fire performance standards.

AIRPORT ENVIRONMENTAL PROFILE

SOLBERG SCANDINAVIAN



RE-HEALING FOAM™
by SOLBERG

•Any Questions?
