

Description

Fomtec ARC 3x3 is a high efficiency multi purpose film forming foam (3x3).

The main advantage of Fomtec ARC 3x3 is the 3% induction ratio on ALL class B fires, also polar solvents.

The film forming characteristics of Fomtec ARC 3x3 means that it spreads rapidly across a fire. As a result, it is highly effective against hydrocarbon fires and with the addition of special polymers it is also highly effective against polar solvents

The low surface tension of the water foam concentrate solution enables the aqueous film, although heavier than the burning liquid, to float on top of the hydrocarbon liquid surface.

When applied on polar solvents a polymeric membrane makes it possible for the foam blanket to extinguish effectively. This works also on foam destroying liquids such as MTBE.

Fomtec ARC 3x3 should be used at 3% proportioned solution on ALL class B fires, also polar solvents, in fresh or seawater.

Application

Fomtec ARC 3x3 is intended for use on class B hydrocarbon fuel as well as on polar solvent i.e Isopropanol, Methanol etc and other foam destroying product fires such as MTBE. It uses only half the quantity to extinguish polar solvent fires in comparison to the traditional 3x6 foam concentrates. It can be used with both aspirating and non-aspirating discharge devices. It is compatible with all dry chemical powders.

Typical Performance

Fomtec ARC 3x3 has been designed to give the best properties of

- Aqueous film forming foam.
- Alcohol resistant foam.

The fire performance of Fomtec ARC 3x3 has been tested according to EN 1568 parts 3 and 4.

Proportioning

Fomtec ARC 3x3 can easily be proportioned at the correct dilution using conventional equipment such as:

- Inline inductors.
- Balanced pressure, variable flow proportioning systems.
- Bladder tanks.
- Around the pump proportioning systems.
- Water turbine driven foam proportioners.
- Self inducting branch pipes and nozzles.

The equipment should be designed to the foam type.

Technical data

Appearance	Clear Amber Liquid
Specific gravity @20°C	1.060 +/- 0.01 g/ml
Brookfield Viscosity approx @ 20°C	1350 mPa.s
pH	7.5 +/- 1.0
Undissolved solids (v/v)	Less than 0.2 %
Freezing point	- 17°C
Pour point	- 10°C
Surface tension approx	< 20.0 mN/m

Storage/Shelf Life

Stored in original unbroken packaging the product will have a long shelf life. The recommended storage temperature range of Fomtec ARC 3x3 ranges from -9°C to 55°C. Shelf life in excess of 10 years will be found in temperate climates. As with all foams, shelf life will be dependent on storage temperatures and conditions. If the product is frozen during storage or transport, thawing will render the product completely usable.

Synthetic foam concentrates should only be stored in stainless steel or plastic containers. Since electromagnetic corrosion can occur at joints between different metals when they are in contact with foam concentrate, only one type of metal should be used for pipelines, fittings, pumps, and tanks employed in the storage of foam concentrates.

Packaging

We supply Fomtec in 25 litre cans and 200 litre drums. We can also ship in 1000 litre containers or in bulk.

International Approvals:

- EN 1568 part 3 and 4.
- Lloyds Register of Shipping.

Project: Fire Extinguishing Media to
EN 1568-3 & EN 1568-4
Specifications

Certificate Number: MCH 0232741/07 A2

Client: Dafo Fomtec AB
PO Box 683
135 26 Tyresö
Sweden

Office: Liverpool

**Client's Order
Number:** -

Date: 20 May 2002

Order Status: Complete

Inspection Dates

First: 29.04.02.

Final: 17.05.02.

This certificate is issued to Dafo Fomtec AB, to certify that at their request, the undersigned Surveyor to this Society did select samples of FOMTEC ARC 3x3, for the purpose of confirming that the properties were within the technical specifications and were in accordance with EN 1568-3 and EN 1568-4.

The necessary tests were witnessed by the Surveyor and the results obtained were all within the limits given in the manufacturers specification, and the requirements of EN 1568-3 and EN 1568-4.

Tolerance to freezing and thawing (Annex E)

No stratification or non-homogeneity could be detected in the sample.

Sediment (Annex C)

Before ageing of the sample = < 0.1%
After ageing of the sample = < 0.1%
(24 hours at 60°C)

Viscosity at 20°C = 1350 mPa.s (Brookfield)

pH of the concentrate at 20°C = 7.0

Surface Tension, Interfacial Tension and spreading coefficient (Annex F)

	<u>Surface Tension</u>	<u>Interfacial Tension</u>	<u>Spreading Coefficient</u>
	Dynes/cm	Dynes/cm	Dynes/cm
Before conditioning	18.0	3.5	+3.5
After conditioning at - -30°C for 24 hrs followed by 48 hrs at 20°C (four cycles)			
Top Sample	17.5	3.4	+4.1
Bottom Sample	17.9	3.6	+3.5
After conditioning at - 60°C for 7 days followed by 2 days at 20°C			
Top Sample	17.3	3.2	+4.5
Bottom Sample	17.5	3.3	+4.2

Expansion and Drainage (Annex G)

Before conditioning of the sample	Fresh		Sea	
Expansion =	7.6		7.5	
25% Drainage time =	6'18"		6'50"	
After conditioning of the sample in accordance with Annex E	Fresh		Sea	
Expansion =	Top 7.8	Bottom 7.8	Top 7.4	Bottom 7.3
25% Drainage time =	5'40"	5'06"	5'10"	5'17"

Fire Tests (Annex H)**A) Forceful Application in accordance with EN 1568-3**

Fire tests carried out in accordance with Annex H1 and H3 using:-

Fresh water and sea water

Preburn time	60 seconds
Foam application	180 seconds
Wait after foam application	300 seconds
Fire tray	144B (4.5m ²)
Fuel	Commercial Heptane on water bed

	Fresh Water		Sea Water
90% Control	42"	44"	42"
99% Control	90"	92"	57"
100% Extinction	122"	139"	104"
25% Burnback time	12'38"	12'51"	12'47"
Air Temp	18.0 °C	11.0 °C	11.0 °C
Water Temp	15.0 °C	15.0 °C	15.0 °C
Fuel Temp	15.0 °C	16.0 °C	15.0 °C
Foam Temp	15.0 °C	16.0 °C	15.0 °C
Wind Speed (m/sec.)	< 1.0	< 1.0	< 1.0

Fire Tests (Annex H) in accordance with EN 1568-4

Fire Tests carried out in accordance with Annex H using:-

Fresh water and sea water

Preburn time	120 seconds
Foam application (fresh water)	300 seconds
Foam application (sea water)	180 seconds
Wait after foam application	300 seconds
Fire tray	55B (1.73m ²)
Fuel	Acetone

	Fresh Water		Sea Water
90% Control	2'21"	2'41"	78"
99% Control	2'36"	3'11"	91"
100% Extinction	3'05"	3'32"	97"
25% Burnback time	5'54"	9'35"	7'58"
Air Temp	13.0 °C	13.0 °C	13.0 °C
Water Temp	16.0 °C	16.0 °C	16.0 °C
Fuel Temp	15.0 °C	15.0 °C	15.0 °C
Foam Temp	17.0 °C	17.0 °C	17.0 °C
Wind Speed (m/sec.)	< 1.0	< 1.0	< 1.0

From the above test results it is confirmed that FOMTEC ARC 3x3 is a film forming foam concentrate suitable for use with fresh and sea water. FOMTEC ARC 3x3 has tolerance to freezing and thawing (Annex E) and is suitable for storage above -30°C. The fire extinguishing performance class is 1 and the burnback resistance level is A using fresh and sea water for Hydrocarbon fuel. The fire extinguishing performance class is 2 and the burnback resistance level is C using fresh water for Polar solvent fuel. The fire extinguishing performance class is 1 and the burnback resistance level is C using sea water for Polar solvent fuel.

Performance level achieved:

Extinguishment class 1 for Hydrocarbon fuel with fresh and sea water.

Extinguishment class 2 for Polar fuel with fresh water and class 1 for Polar fuel with sea water.

Burnback resistance level A for Hydrocarbon fuel and level C for Polar fuel.



M. Williams
Surveyor to Lloyd's Register

Material Safety Data sheet

According to 1907/2006/EG annex II (REACH-regulation)

Latest Revision: 01/11/2008

MSDS No :

Fomtec ARC 3X3

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING

Identification of the substance or preparation : ARC 3X3

Use of the substance/preparation : Fire Extinguishing Foam Concentrate

Company/Undertaking identification : Dafo Fomtec AB, P.O. Box 683, SE – 135 26 Tyreso, Sweden
 Tel: +46 8 506 405 66
 Fax: +46 8 506 405 29

Emergency telephone :

2. HAZARD IDENTIFICATION

- Irritating to eyes

3. COMPOSITION/INFORMATION ON INGREDIENTS

No	Name of Ingredient	CAS-No	EINECS-No	Cons.Weight% ARC 3X3	Health class
1	Water	7732-18-5	231-791-2	Balance	
2	2-(2-butoksyetoksy)etanol	112-34-5	203-961-6	1-12	Xi R36
3	Hydrocarbon surfactants	-	-	1-8	Xi, R36/38
4	Fluorosurfactants	-	-	<5	Xi R,36/38
5	Polyethylene glycol	25322-68-3	500-038-2	1-5	
6	Polymer	11138-66-2	234-394-2	<5	

4. FIRST AID MEASURES

- Eye contact : Rinse thoroughly with running water at least for ten minutes. Seek medical advice if symptoms persists.
- Skin contact : Remove contaminated clothing etc and wash skin thoroughly with water. Seek medical advice if irritation persists.
- Ingestion : Rinse mouth with water. Give lots of water to drink. Do not induce vomiting. Seek medical advice if you are unwell.
- Inhalation : Remove the casualty into fresh air. Seek medical advice if symptoms Persists.

5. FIRE FIGHTING MEASURES

- No specific measures are required as the product itself is a fire fighting agent. If product containers are involved in fire, then a suitable extinguishing agent should be used.
- Evacuate all personnel, use protective clothing use breathing apparatus if required.
- Stop release of product to fire, Keep away from heat, use water to cool tanks. Move tanks from fire area if possible with out risk. Fire to be fought from safe distance. Poisonous decomposition products may be created during a fire.

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions : Avoid eye and skin contact. Supply fresh air in enclosed spaces. See heading 8 of this MSDS.
- Environmental precautions : Seal off the spill area with absorbing materials to avoid spreading of release to water or water treatment systems.
- Method for cleaning up : Shovel up the absorbed material and place in a labeled, sealed container for subsequent disposal.. The practice of washing in to drains should be avoided.

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7. HANDLING AND STORAGE

Handling : The product should be diluted before use. Avoid skin and eye contact. Use personal protective equipment according to section 8. Avoid spill around the containers, the material may be slippery.

Storage : Product should be stored in sealed, original containers. Freezing and thawing do not effect the properties but care must be taken to avoid freezing of the container and its contents since the expansion of the container contents may cause cracking of the completely rigid container as ice forms. Do not store above +50C for longer periods.
Must comply to the national regulations for products classified as water hazard class 1.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Occupational Exposure limit values:

2-(2-butoxyethoxy) ethanol CAS No: 112-34-5

WEL-LTEL / EC 67.5 mg/cu.m.

WEL-STEL / EC-STEL 101.2 mg/cu.m.

Exposure Controls: : Work under local ventilation

Hand protection : Suitable gloves made from nitrile or butyl rubber

Eye protection : Use safety goggles

Skin protection : Use protective clothings such as overalls

Respiratory protection : Gas mask with filter type A may be used if concentration in air > exposure limit

Environmental exposure control : Store or dispose concentrate in accordance with national regulations

9. PHYSICAL AND CHEMICAL PROPERTIES

Type of material:	Pseudoplastic, liquid
Colour:	Clear pale yellow
Odour:	Organic odour
Solubility:	Miscible with water in all proportions
Freezing point:	-17 C
Pour point:	-10 C
Specific gravity at 20 C	1.05 – 1.07
pH	6.5 – 8.5
Viscosity Brookfield	1700 m.Pa.s
Boiling point	100 C at 760mm Hg
Flash point:	>98 C
Flammability	Not flammable
Oxidising properties	None
Explosive properties	Product has no explosive property

10. STABILITY AND REACTIVITY

Material to avoid : Keep away from heat sources. Avoid strong oxidisers.

Conditions to avoid : Stable under normal conditions

Hazardous decomposition products : Thermal decomposition of containers and/or products may generate acrid smoke, fumes, carbon monoxide, carbon dioxide (oxygen depleting), traces of nitrogen oxide and Sox.

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11. TOXICOLOGICAL INFORMATION

Acute toxicity:

2-(2-butoxyethoxy) ethanol

LD50 oral rat 5660 mg/Kg

LD50 dermal rabbit 2700 mg/Kg

Acute effects:

Skin contact : Classified as non-irritant according to the dangerous preparation directive 1999/45/EU

Eye contact : Can cause redness or irritation of the eye tissue

12. ECOLOGICAL INFORMATION

Ecotoxicity

Data has been deduced from a similar product

3%

Rainbow Trout LC50 (96 hours) >2000mg/l

Daphnia Magna EC50 (24 hours) >1000mg/l

Persistence and degradability

The product is biodegradable

BOD (5 days) 230000mg/l

COD 414500mg/l

Biodegradation 55.49%

BIOACCUMULATION

Not expected to bioaccumulate due to metabolism and excretion.

13. DISPOSAL CONSIDERATIONS

Waste should be disposed via local authority waste collection service or registered waste carrier ensuring that the destination is a licensed facility. All packaging shall be emptied and removed according to regulations, or be re circulated without removal of labeling. Do not dispose with house hold garbage.

European Waste Code : 16 Wastes not otherwise specified in the list
1603 Off-specification batches and unused products
160306 Organic wastes other than those mentioned in 160305

14. TRANSPORT INFORMATION

Not classified as Dangerous or hazardous for transport under:

ADR (Transport by road)

RID (Transport by rail)

ADNR (Transport by inland waterways)

IMDG (Maritime Transport)

ICAO (Transport by air)

Not restricted for any mode of international transport

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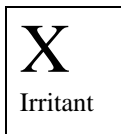
MSDS No :

Fomtec ARC 3X3

15. REGULATORY INFORMATION

Classification according to European directive 67/548/EEC and 1999/45/EC

Label For Supply : **FOR 3X3**



Risk Phrases: R36 / R38 Irritating to eyes and skin

REFERENCES

Health and Safety at work Act 1974

Chemicals (Hazard Information & Packaging for supply) Regulations 1994 / Amendment 1996

EC Directives: Substance Directive 67/548/EEC as amended by 69/81/EEC, 75/409/EEC, 79/831/EEC General Preparations Directive 88/379/EEC. 1999/45/EC, 2001/58/EC

Classification and Labelling of Substances and Preparations Dangerous for Supply.

Transport of Dangerous Goods: ADR,RID,IMDG and IATA

Guidance Notes: Occupational Exposure Limits EH40/96

Note: EH40 is revised on an annual basis and latest issue should therefore be applied

16. OTHER INFORMATION

RELEASED: 01/11/2008

INFORMATION SOURCES

Datasheet from the suppliers

Work protection agency information pamphlet about protective equipment

Work protection agency information pamphlet about gloves

“What you Need to know when you use protective breathing equipment” (Information, order number.: 539, Work protection agency)

Sax,N.I. and R.J. Lewis,Sr: Dangerous Properties of Industrial Materials, Seventh Edition, Volumes 1 to 3 (1991).

DISCLAIMER: This information is based on our current knowledge and is intended to describe the product for the purpose of health, safety and environmental requirements. The product should not be used for purposes other than fire fighting. The user is responsible for ensuring that requirements of relevant legislation are complied with.