Saucepan Extinguishing Solutions

Documented Saucepan Fire Extinguisher (SFE) Tests

Issue 1.01

May 2018

CONTENTS

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Issue	Date	Amendment Details	Author	Checked
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Distribution
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1.0 INTRODUCTION

This report is intended to review the current methods of extinguishing a saucepan fire and then compare with an alternative DM Solution concept.

This report will also document fire testing carried out on the DM Solutions concept, along with alternative manufacturers solutions so the performance of the DM Solutions extinguishing method can be analysed.

2.0 ANALYSIS OF THE KITCHEN COOKING FIRES

Analysis of fires in England is documented by the Department for Communities and Local Government and is based upon statistical information provided by the Local Authority Fire and Rescue Services.

The April 2014 to March 2015 statistics provide the following headlines:

- There were 258 fire fatalities in England in 2014 to 2015.
- 63 per cent of all fire fatalities were in accidental dwelling fires.
- There were 3,235 non-fatal fire hospital casualties.
- Local authority fire and rescue services attended around 154,700 actual fires in England in 2014 to 2015.
- 44 per cent of all incidents attended were fire false alarms.
- There were 28,200 accidental dwelling fires.
- 61 percent of domestic fires occurred in the kitchen.
- 52 percent of domestic fires were caused by the cooking appliances.

It can be concluded from the above that cooking appliances account for the majority of domestic fires in England. Unfortunately, this is not broken down further between hobs and ovens, but from conversations with experienced fire fighters the majority reference hobs as the greater risk. This is further documented on Fire Brigade Organisations web sites which have campaigns for kitchen fires which concentrate on hob fires.
Generally, with oven fires the oven door can be closed, starving the fire of oxygen resulting in self-extinguishing.

The fires identified in the above statistics would be within domestic properties constructed in accordance with the Building Regulations.

3.0 REVIEW OF MARKET SOLUTIONS

Various methods of extinguishing saucepan fires have developed on the back of cooking fires, which the occupant is intended to use on the occurrence of a cooking fire.

The following section reviews the various solutions used to extinguish a cooking hob fire.

3.1 Saucepan Lid

When a saucepan fire has occurred, it is recommended the lid is placed over the burning saucepan to starve the fire of oxygen. This would involve the occupant in an emergency lifting the lid over the flame and placing exactly on the saucepan top, so as to starve the oxygen.
In doing this the flames would be lapping out the side as the lid is lowered on the flames.
The heating source would then need to be isolated.
No ongoing maintenance is required.

It is likely that as the occupant lowers the lid, they would be exposed to the flames creating a dangerous environment.

3.2 Fire Blanket

When a saucepan fire has occurred, it is recommended the fire blanket is placed over the burning saucepan to starve the fire of oxygen. This would involve the occupant in an emergency unpacking the fire blanket, opening it up and laying it over the saucepan fire.
From our review, the blanket should only be applied after the heating source is turned off.
No ongoing maintenance is required.

The user must remember where the blanket is located and generally remove from a bag, before isolating the heating source knob and then applying the fire blanket over the saucepan fire.

It is likely that as the occupant lowers the fire blanket, they would be exposed to the flames creating a dangerous environment.

3.3 Fire Extinguisher

When a saucepan fire has occurred, it is recommended the fire extinguisher nozzle is directed and released over the burning saucepan to starve the fire of oxygen and cool the cooking oil. This would involve the occupant in an emergency pulling the extinguisher pin, squeezing the handle and directing the nozzle at the fire. This can form an effective method of extinguishing a fire.
The effectiveness of this method can be significantly affected by how the extinguisher is used. As the fire initially reacts with the extinguishing agent it initially increases the flame growth which may deter the occupant from completely discharging the extinguisher. Training would be needed to overcome this issue.

The fire extinguisher generally have a shelf life of five years.

The Class F fire extinguisher offers an excellent method of extinguishing a cooking oil fire for a trained occupant.

3.4 Saucepan Fire Extinguisher

When a saucepan fire has occurred, it is recommended the Saucepan Fire Extinguisher sachet is lowered into the saucepan with a long kitchen utensil. This would involve the occupant in an emergency pulling the sachet out of the box and lowering into the saucepan with a long utensil. When the fire is extinguished the heating source would need to be turned off.
In our view the Saucepan Fire Extinguishers form a revolutionary simple method of extinguishing a saucepan fire with no training required. The sachet containing the extinguishing agent is simply placed into the burning saucepan with a long utensil which reacts chemically to form a blanket of foam on the top of the oil to starve the oxygen and extinguish the burning oil. The heating source can then be safely isolated.

The SFE extinguisher has a shelf life of five years.

SFE Sachets offer a revolutionary, simple and safe way of extinguishing dangerous pan fires, within seconds with no training required.

4.0 SAUCESPAN FIRE EXTINGUISHER REVIEW

DM Solutions requested FDS Consult to review the Saucepan Fire Extinguisher (SFE) samples provided by them and carry out ad hoc testing as outlined in Appendix A of this report.

The DM Solutions SFE approach involves a small red box containing a Sachet which is recommended to be located within a prominent position within the kitchen as shown in Figure 1 below.

In the event of a fire, the box is removed and the SFE Sachet taken out of the box as shown in Figure 3. The SFE Sachet is then placed on a long utensil and placed into the burning saucepan to extinguish the saucepan fire.

Figure 1 – SFE Box

DM Solutions have worked with a Chemist to develop a Potassium Carbonate based solution which reacts with fire to form a chemical reaction. This forms a self-floating foam layer on the surface of the burning oil to extinguish the fire and cool the oil. The solution is sealed within a non-combustible sachet which has a shelf life of five years. The SFE sachet contains 60 grams of liquid which is boxed within a display box containing simple instructions. Information on the solution is provided within the DM Solutions Technical Data Sheet in Appendix B of this report.

As part of testing the DM Solutions product, FDS Consult were provided with alternative manufacturers solutions to test.

The testing is only concerned with extinguishing the fire. Success of the extinguishing solution is judged by the ability to extinguish the saucepan fire and preventing it spreading to the hob. An oil based fire is used, which is the hardest fire to extinguish.

4.1 Testing Regime

The tests were carried out on a gas test rig as shown in Figure 2 below. This was a domestic four ring NEFF gas hob located on a worktop. Three solid sides were formed around the hob to simulate the back wall and possible two side kitchen units as shown in Figure 2 below.

The cooking oil used was a branded Morrisons vegetable oil.

Saucepans of various size, as identified within the Test Sheets, were used so different volumes of oil and surface areas could be evaluated.

Figure 2 – Test Rig

4.2 Test Procedure

The tests followed the procedure outlined below:

1) A quantity of oil as identified in the Test Sheet was placed into the saucepan.
2) The gas hob burner was turned on and the oil allowed to heat until the oil started spitting before supporting a continuous surface fire.
3) After a period of continuous fire, the various extinguishing agents were added as outlined in the Test Sheets.
4) The success of the test was judged in extinguishing the fire from the saucepan and preventing fire spreading to the hob.
5) After the fire was extinguished, the gas hob was turned off.

Preliminary test 1 to 3, were conducted outside to scope the success of various SFE Sachet sizes.

Tests 4 to 9 were conducted indoors in a controlled environment with data loggers utilised to review temperatures.

All the tests were recorded on video for further analysis.

4.3 Summary of Test Results

Tests 1 to 3 were carried out externally using various SFE sachet sizes.

Tests 4 to 9 were conducted internally and data loggers were used to record temperatures at the various times.

Tests 1 to 6 were carried out using various DM Solutions SFE sachet sizes. The fires were extinguished efficiently. Test 1 to 3, which were conducted externally had more disturbance to the burning oil fire.

Test 1 to 6, using the DM Solutions SFE Sachet was classed as a success as the fires were extinguished quickly and did not spread even when the liquid over spilled the saucepan and the gas was left turned on.

Test 7 was carried out using a boxed saucepan fire extinguisher from China. The fire was not extinguished and a DM Solutions SFE Sachet was used to successfully extinguish the fire. Due to the volume of the box, the expanding foam and oil overflowed the saucepan onto the hob but combustion was not supported with the gas flame left on as is the objective of the SFE.
The first part of the test using an alternative product was classed a failure.
The second part of the test using the DM Solutions SFE Sachet utilised to extinguish the failed fire attempt was successful.

Test 8 was carried out with a Class F extinguisher agent which was enclosed in a non-combustible bag. On applying the bag, it formed a fire ball with burning oil. The fire was extinguished, but the oil burning residue was left all over the worktop and hob. It is our view that in a domestic environment with an untrained user, they could be burned with oil and is likely any kitchen furniture above would be ignited.
This test was classed as a failure.

Test 9 was carried out using a saucepan fire extinguisher currently stocked by a UK Distributor. On applying the sachet, the flame formed a fire ball with the burning oil overflowing onto the hob. The edges of the saucepan and overflowing oil on the hob continued to support combustion after the gas was turned off.
This test was classed as a failure.

The findings of the testing demonstrated that the DM Solutions SFE Sachet extinguisher was successful at extinguishing the saucepan oil fires and forms a viable extinguisher medium.

The tests are outlined in detail in Appendix A of this report.

5.0 USE OF THE SFE SACHET

The SFE Sachet is used as outlined in the instructions below

Instructions for use of SFE Sachet




1. **Remove Sachet from the Box.**
2. **Gently place Sachet into saucepan with long utensil.**
3. **Fire extinguished.**
4. **Turn off heating source.**
5. **Ventilate and leave the room.**
6. **After saucepan has cooled, wash and clean.**

Figure 3 – SFE Instructions

6.0 CONCLUSION

The DM Solutions Saucepan Fire Extinguisher SFE forms an effective way of extinguishing oil based saucepan fires. We consider that the method in which it used is simpler and safer than the other methods reviewed in this report.

The testing demonstrated the DM Solutions 60g SFE Sachet, extinguishes saucepan fires by forming a self-floating foam layer to prevent oxygen entering the fire and cools the oil.

The chemical reaction turns the oil to a viscous liquid which does not support combustion where it over flows the saucepan onto the gas hob

The SFE forms an effective method of extinguishing saucepan fires without any training.

Appendix A – TEST REPORT

Test 1

1) Object of Test

Adhoc test carried out externally to evaluate effectiveness of the SFE liquid

2) Setup

Saucepan diameter 280mm
Saucepan height 50mm
Oil quantity – 1.2 litres
Gas ring – 70mm
Cooling oil – Morrisons Sunflower oil
Video & note reference 1802A
60g SFE Sachet
Date & time – 10 February 18 @ 11:28

3) Test Procedure

1) Saucepan with cooking oil was placed on the gas hob and the hob was turned on
2) From the commencement of the video continuous ignition occurred on surface of the cooking oil at 2:38 minutes (Image 1)
3) The SFE Sachet was placed in the saucepan at 3:38 minute (Image 2)
4) The fire was extinguished at 3:44 minutes (Image 3)
5) The gas hob was turned off at 3:54 minutes

4) Observations

1) The sachet melted and the SFE liquid was released to form a foam layer floating on the surface of the burning oil
2) The foam and liquid remained within the saucepan
3) The fire was quickly extinguished

Image 1

Image 2

Image 3

Test 2

1) Object of Test

Adhoc test carried out externally to evaluate effectiveness of the SFE liquid

2) Setup

Saucepan diameter 200mm
Saucepan height 35mm
Oil quantity – 0.4 litres
Gas ring – 70mm
Cooling oil – Morrisons Sunflower oil
Video & note reference 1802B
40g SFE Sachet
Date & time – 11 February 18 @ 10:05

3) Test Procedure

1) Saucepan with cooking oil was placed on the gas hob and the hob was turned on
2) From the commencement of the video, continuous ignition occurred on the surface of the cooking oil at 0.5 minutes
3) The SFE Sachet was added to the saucepan at 1 minute (Image 1)
4) The fire was extinguished at 1.24 minutes (Image 2)
5) The gas hob was turned off at 1.46 minutes

4) Observations

1) The sachet melted and the SFE liquid was released to form a foam layer floating on the surface of the burning oil
2) The foam and liquid remained within the saucepan
3) The fire was extinguished after 24 seconds
4) The longer time taken for the oil to be extinguished can be explained by the smaller 40g SFE Sachet
5) The gas hob was left on for an additional 22 seconds which made no difference

Image 1

Image 2

Test 3

1) Object of Test

Adhoc test carried out externally to evaluate effectiveness of the SFE liquid

2) Setup

Saucepan diameter 280mm
Saucepan height 50mm
Oil quantity – 0.7 litres
Gas ring – 70mm
Cooling oil – Morrisons Sunflower oil
Video & note reference 1802C
60g SFE Sachet
Date & time – 11 February 18 @ 11:31

3) Test Procedure

1) Saucepan with cooking oil was placed on the gas hob and the hob was turned on
2) From the commencement of the video, continuous ignition occurred on the surface of the cooking oil at 10 seconds
3) The SFE Sachet was added to the saucepan at 38 seconds (Image 1)
4) The fire was extinguished at 45 seconds (Image 2)
5) The gas hob was turned off at 60 seconds

4) Observations

1) The sachet melted and the SFE liquid was released to form a foam layer floating on the surface of the burning oil
2) The foam and liquid remained within the saucepan
3) The fire was extinguished after 7 seconds
4) The gas hob was left on for an additional 15 seconds which made no difference

Image 1

Image 2

Thermocouple Setup

Thermocouples as identified below were setup and connected to a data logger (zx1991).

Probe 1 – 200mm above saucepan
Probe 2 – In saucepan oil
Probe 3 – 70 to 130mm to right of saucepan at hob level to simulate temperature at gas knobs
Probe 4 – Ambient air

Test 4

1) Object of Test

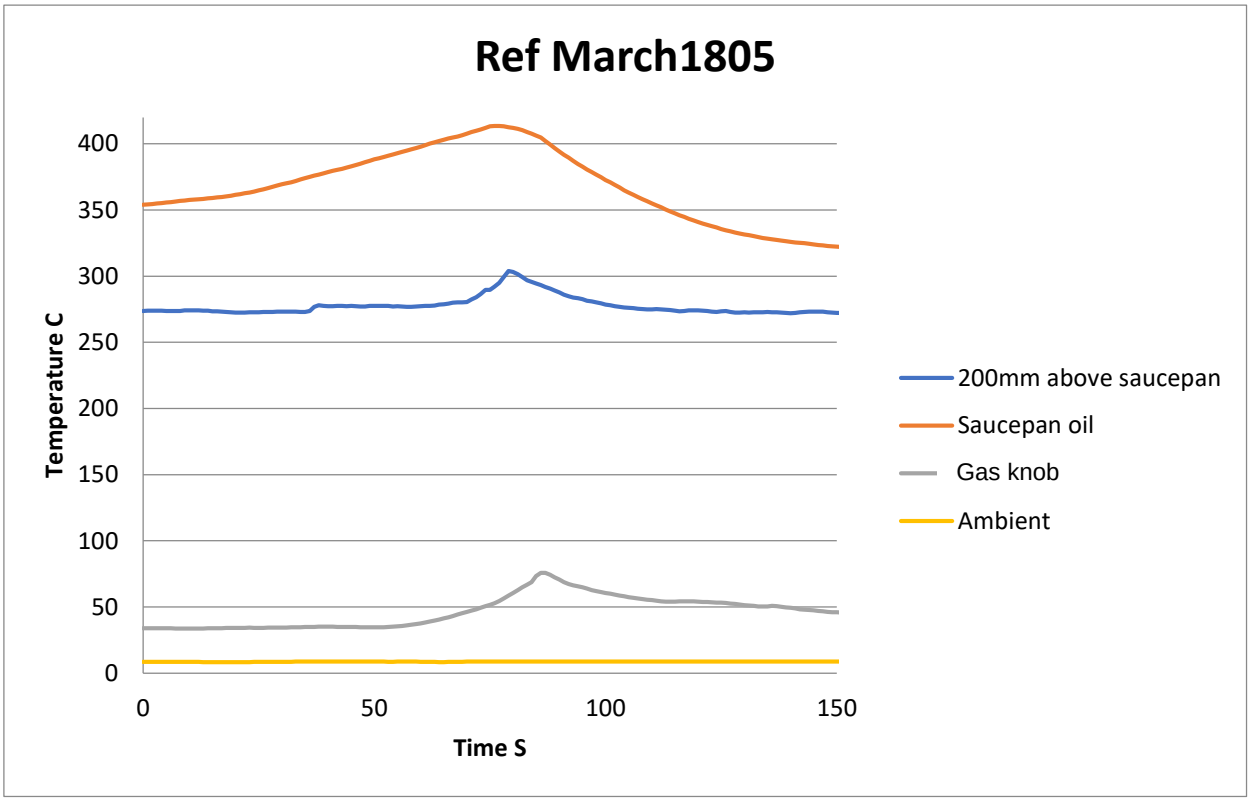
Data Log test carried out internally to evaluate effectiveness of the SFE liquid

2) Setup

Saucepan diameter 280mm
Saucepan height 50mm
Oil quantity – 1.2 litres
Gas ring – 70mm
Cooling oil – Morrisons Sunflower oil
Video & note reference March1805
60g SFE Sachet
Date & time – 22 March 18 @ 11:23

3) Test Procedure

1) Saucepan with cooking oil was placed on the gas hob and the hob was turned on
2) From the commencement of the video camera, continuous ignition occurred on the surface of the cooking oil at 1:30 minutes
3) The SFE Sachet was added to the saucepan at 2:14 minute *|78 seconds on graph|* (Image 1)
4) The fire was extinguished at 2:20 minutes *|84 seconds on graph|* (Image 2)
5) The gas hob was turned off at 2:22 minutes



4) Observations

1) The sachet melted and the SFE liquid was released to form a foam layer floating on the surface of the burning oil
2) The foam and liquid remained within the saucepan
3) The fire was quickly extinguished by forming a foam layer on top which also turned the oil into a heavy grease like substance
4) The oil temperature reduced from 413ºC at 78 seconds to 321ºC at 152 seconds
5) 92ºC in 74 seconds
6) The temperature 70mm to the right of the saucepan was approximately 70ºC at the time of saucepan suppression. The probe was too close to the saucepan resulting in an error reading.

Image 1

Image 2

Test 5

1) Object of Test

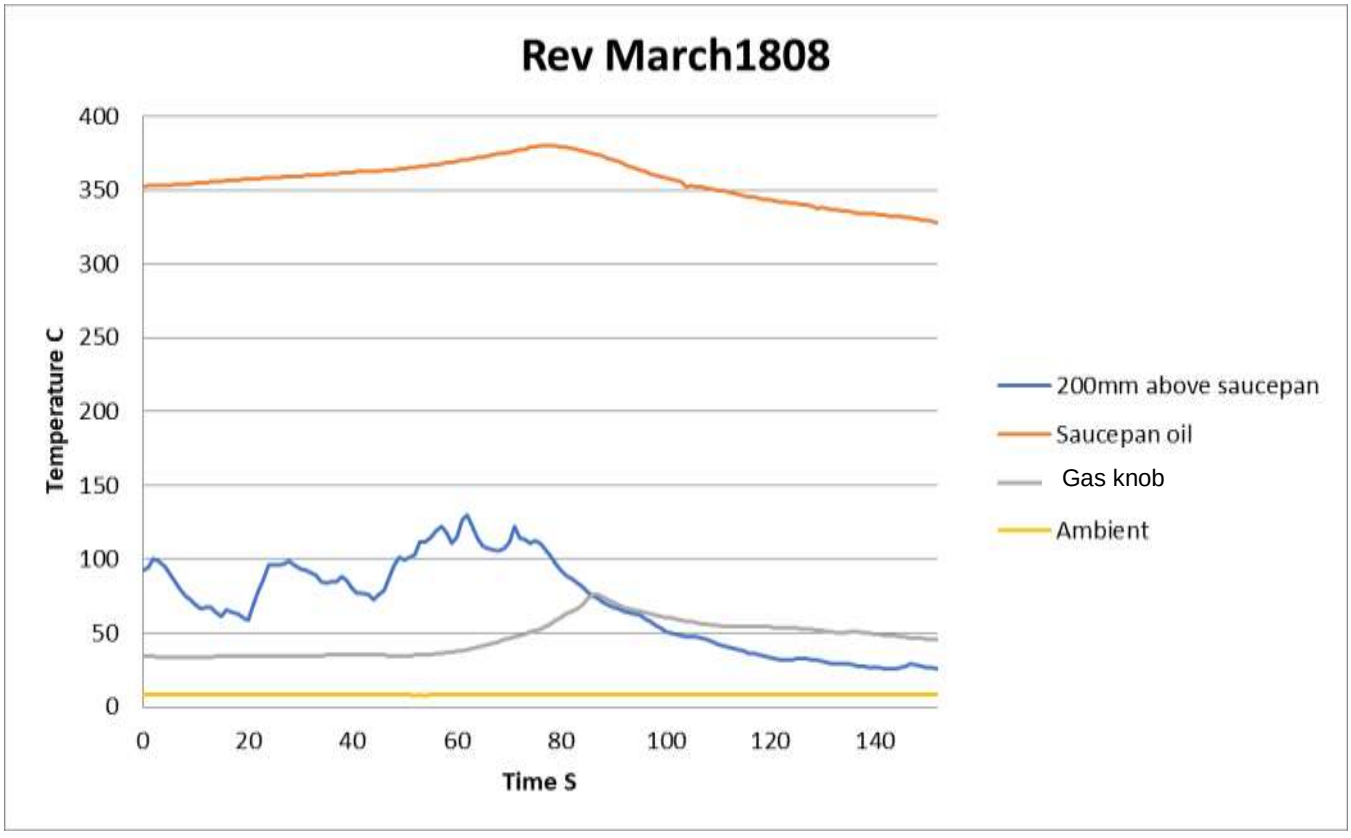
Data Log test carried out internally to evaluate effectiveness of the SFE liquid

2) Setup

Saucepan diameter 280mm
Saucepan height 50mm
Oil quantity – 1.0 litres
Gas ring – 70mm
Cooling oil – Morrisons Sunflower oil
Video & note reference March1808
60g SFE Sachet
Date & time – 22 March 18 @ 12:45

3) Test Procedure

1) Saucepan with cooking oil was placed on the gas hob and the hob was turned on
2) From the commencement of the video camera, continuous ignition occurred on the surface of the cooking oil at 55 seconds
6) The SFE Sachet was added to the saucepan at 1:17 minute *|77 seconds on graph|* (Image 1)
7) The fire was extinguished at 1:23 minutes *|83 seconds on graph|* (Image 2)
8) The gas hob was turned off at 1:25 minutes



4) Observations

1) The sachet melted and the SFE liquid was released to form a foam layer floating on the surface of the burning oil
2) The foam and liquid remained within the saucepan
3) The fire was quickly extinguished by forming a foam layer on top which also turned the oil into a heavy grease like substance
3) The oil temperature reduced from 380ºC at 77 seconds to 327ºC at 153 seconds
4) 53ºC in 76 seconds
5) The temperature 70mm to the right of the saucepan was approximately 70ºC at the time of saucepan suppression. The probe was too close to the saucepan resulting in error readings.

Image 1

Image 2

Test 6

1) Object of Test

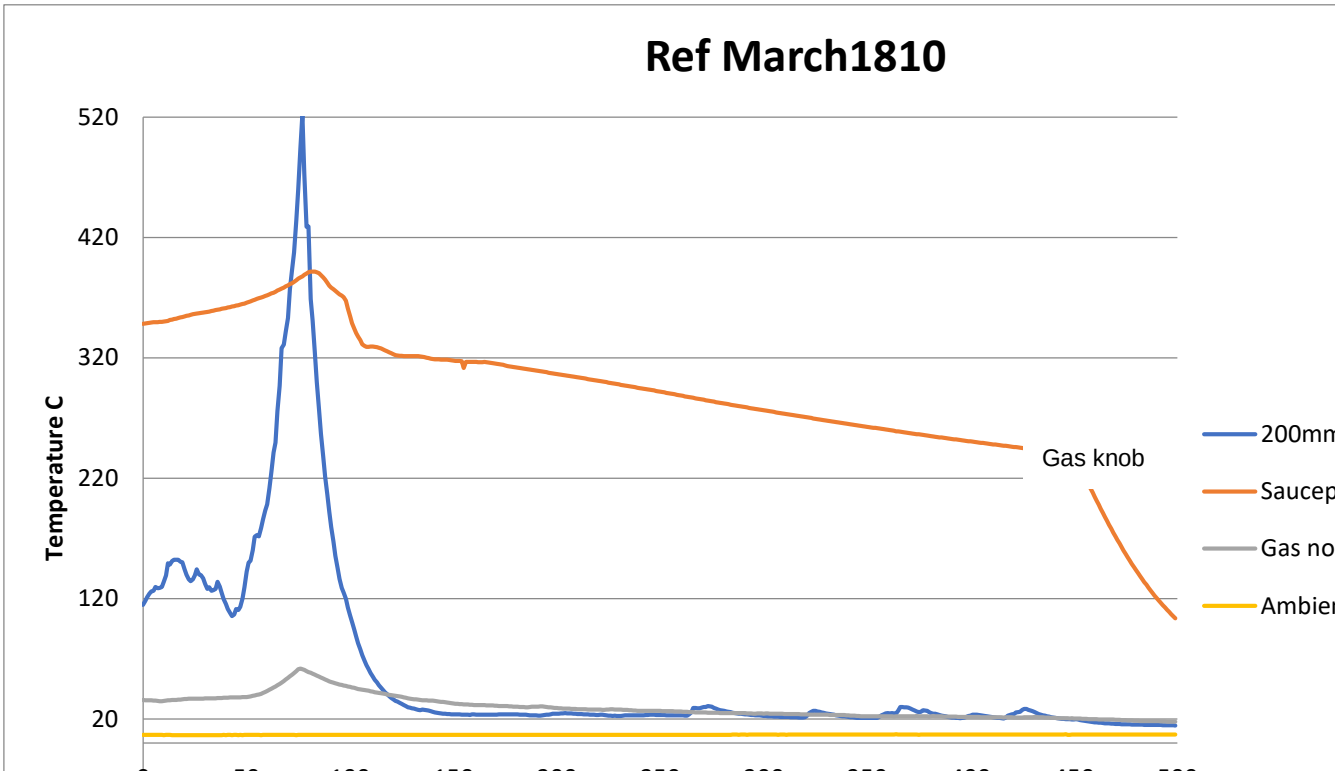
Data Log test carried out internally to evaluate effectiveness of the SFE liquid

2) Setup

Saucepan diameter 280mm
Saucepan height 50mm
Oil quantity – 0.8 litres
Gas ring – 70mm
Cooling oil – Morrisons Sunflower oil
Video & note reference March1810
60g SFE Sachet
Date & time – 22 March 18 @ 13:33

3) Test Procedure

1) Saucepan with cooking oil was placed on the gas hob and the hob was turned on
2) From the commencement of the video camera, continuous ignition occurred on the surface of the cooking oil at 55 seconds
3) The SFE Sachet was added to the saucepan at 1:22 minute *|84 seconds on graph|* (Image 1)
4) The fire was extinguished at 1:29 minutes *|93 seconds on graph|* (Image 2)
5) The gas hob was turned off at 1:33 minutes



4) Observations

1) The sachet melted and the SFE liquid was released to form a foam layer floating on the surface of the burning oil
2) The foam and liquid remained within the saucepan
3) The fire was quickly extinguished by forming a foam layer on top which also turned the oil into a heavy grease like substance
4) The oil temperature reduced from 391ºC at 84 seconds to 103ºC at 499 seconds
   288ºC in 415 seconds
5) The temperature 150mm to the right of the saucepan was approximately 45ºC at the time of saucepan suppression making it safe to turn the gas knob off.

Image 1

Image 2

Test 7

1) Object of Test

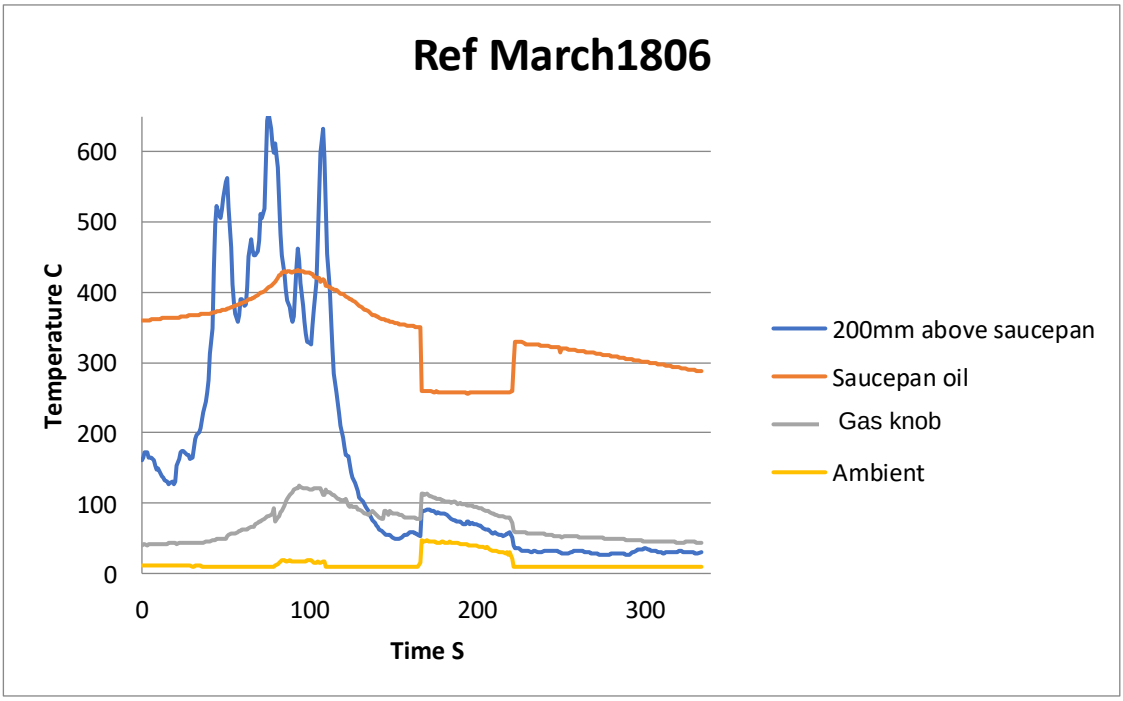
Data Log test carried out internally to evaluate effectiveness of alternative BOX solution from China. Box was 160 x 75 x 20mm with cut outs. Supplier claims the box sachet included potassium salt.

2) Setup

Saucepan diameter 280mm
Saucepan height 50mm
Oil quantity – 1 litres
Gas ring – 70mm
Cooling oil – Morrisons Sunflower oil
Video & note reference March1806
First application was a box 80g boxed solution
Second application was 60g SFE Sachet
Date & time – 22 March 18 @ 12:03

3) Test Procedure

1) Saucepan with cooking oil was placed on the gas hob and the hob was turned on
2) From the commencement of the video camera, continuous ignition occurred on the surface of the cooking oil at 36 seconds *|27 seconds on graph|*
3) The alternative BOX was added to the saucepan at 1:28 minute *|79 seconds on graph|* (Image 1)
4) The SFE Sachet was added to the saucepan at 1:55 minute *|106 seconds on graph|* (Image 3)
5) The fire was extinguished at 1:57 minutes *|108 seconds on graph|* (Image 4)
6) The gas hob was turned off at 2:11 minutes



4) Observations

1) The alternative BOX solution was added at 1:28 minute.
2) The fire continued to grow with the BOX solution having no visual effect as seen from image 2
3) At 1:55 minutes after 27 seconds it was considered the Box solution was providing no benefit and was classed as failing.
4) When the SFE sachet was added it melted and the SFE liquid was released to form a foam layer floating on the surface of the burning oil
5) The fire was quickly extinguished by forming a foam layer on top which also turned the oil into a heavy grease like substance
6) The oil temperature reduced from 419ºC at 106 seconds to 287ºC at 334 seconds
7) 132ºC in 228 seconds
8) It was observed the SFE foam and saturated oil overflowing due to the volume. With the gas still on, no ignition of the oil occurred.
9) The temperature 150mm to the right of the saucepan was approximately 45ºC at the time of saucepan suppression making it safe to turn the gas knob off.

Image 1

Image 2

Image 3

Image 4

Test 8

1) Object of Test

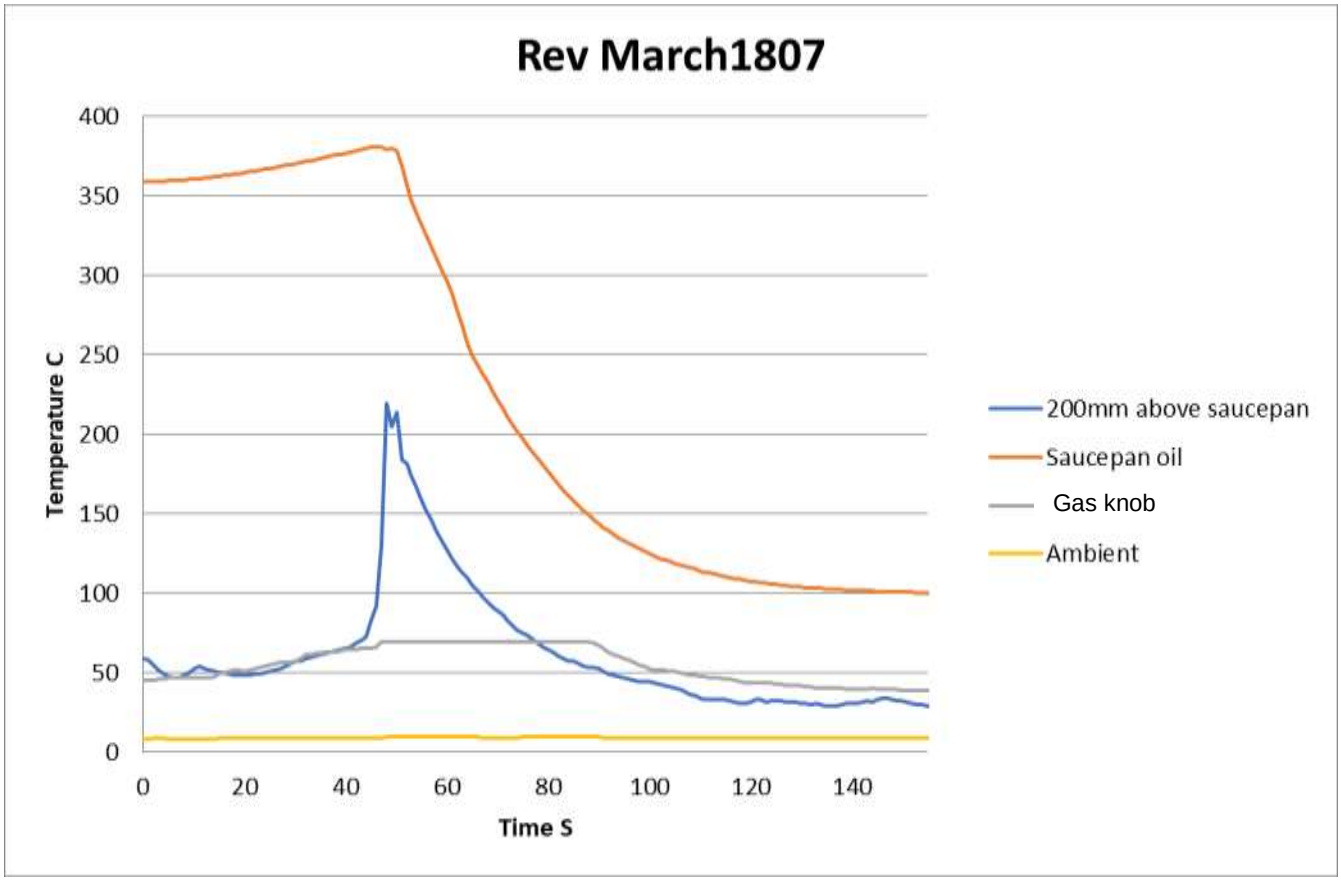
Data Log test carried out internally to evaluate effectiveness of applying a Class F chemical extinguishing in a sachet to the oil fire

2) Setup

Saucepan diameter 280mm
Saucepan height 50mm
Oil quantity – 0.5 litres
Gas ring – 70mm
Cooling oil – Morrisons Sunflower oil
Video & note reference March1807
100g of Class F chemical extinguisher in a Sachet
Date & time – 22 March 18 @ 12:27

3) Test Procedure

1) Saucepan with cooking oil was placed on the gas hob and the hob was turned on
2) From the commencement of the video camera, continuous ignition occurred on the surface of the cooking oil at 14 seconds
3) The Class F Sachet was added to the saucepan at 55 seconds *|50 seconds on graph| (*Image 1)
4) The saucepan oil fire was extinguished at 1:06 minutes (Image 6)
5) The gas hob was turned off at 1:10 minutes



4) Observations

1) On applying the Class F sachet, the flame exploded into a fire ball with burning liquid splashing to the worktops as can be seen from image 2 to 5. Was considered dangerous to the occupant similar to water been added to burning oil.
2) The saucepan fire was extinguished by Class F agent.
3) The worktop splashes which were burning extinguished after a few seconds.
4) It is estimated 40% of the oil was discharged from the saucepan.
5) The test was considered dangerous.
6) The oil remaining in the saucepan was cooled quickly and remained as a liquid.

Image 1

Image 2

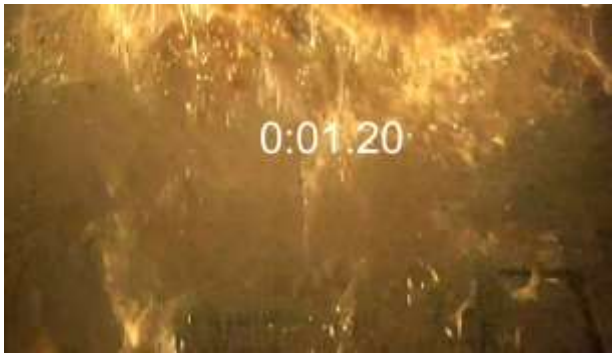


Image 3

Image 4

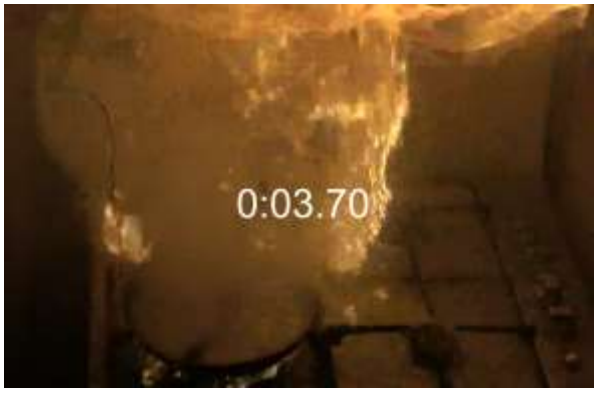


Image 5

Image 6

Test 9

1) Object of Test

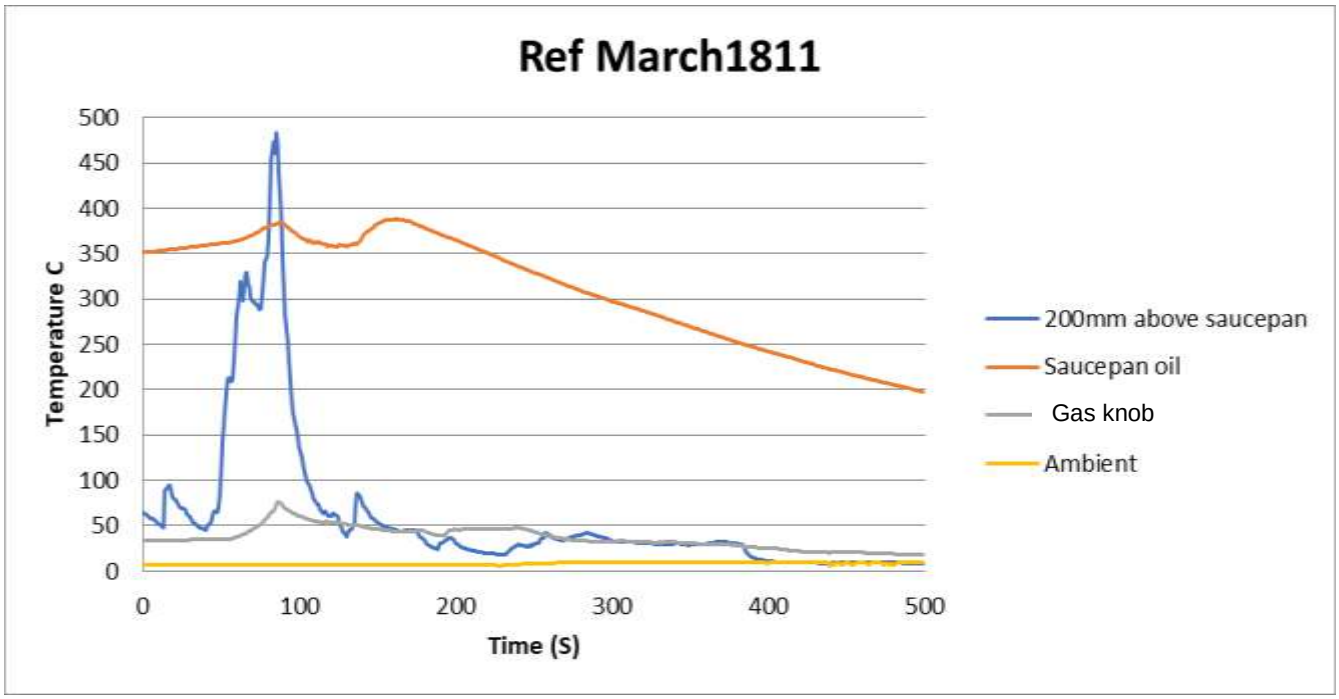
Data Log test carried out internally to evaluate effectiveness of the UK Distributor Sachet solution

2) Setup

Saucepan diameter 280mm
Saucepan height 50mm
Oil quantity – 0.5 litres
Gas ring – 70mm
Cooling oil – Morrisons Sunflower oil
Video & note reference March1811
55g Potassium Salt Sachet sold by a UK Distributor
Date & time – 22 March 18 @ 14:04

3) Test Procedure

1) Saucepan with cooking oil was placed on the gas hob and the hob was turned on
2) From the commencement of the video camera, continuous ignition occurred on the surface of the cooking oil at 50 seconds
3) The Sachet was added to the saucepan at 1:20 minute *|84 seconds on graph|* (Image 1)
4) The gas hob was turned off at 1:40 minutes
5) Uncontrolled ignition continued



4) Observations

1) On applying the sachet, it expanded causing the burning oil to overspill onto the hob.
2) The flames increased as can be seen from image 2 & 3
3) The centre of the saucepan was cover in foam, but the sides of the saucepan and hob surface continued to burn out of control as can be seen from image 4
4) The fire continued to burn within the saucepan and on the hob surface as can be seen from image 5 & 6
5) The test was classed as dangerous and suspended.

Image 1

Image 2

Image 3

Image 4

Image 5

Image 6

APPENDIX B – SFE SACHET TECHNICAL DATA SHEET

DM Solutions

Saucepan Fire Extinguisher (SFE)

Material Safety Data Sheet

UN Number: NOT APPLICABLE

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name	:	Saucepan Fire Extinguisher
Model	:	SFE
Brand	:	DMS SFE Saucepan Fire Extinguisher
General Use	:	Class F extinguishing agent for cooking oil fires
Product of	:	DM Solutions, Esplanade House, Esplanade, Essex. CM3 6AW Email: technical@dmsolutions.co.uk URL: www.dmsolutions.co.uk

2. HAZARDS IDENTIFICATION

Classification According to Regulation (EC) No 1272/2008 (CLP)
Not classified
Classification According to Directive 1999/45/EC
Not classified
Labelling According to Regulation (EC) No. 1272/2008 (CLP
No labelling applicable
Other Hazards:
This substance / mixture does not fall under the PBT criteria of REACH, annex XIII
This substance / mixture does not fall under the vPvB criteria of REACH, annex XIII

3. COMPOSITION/INFORMATION ON COMPONENTS

Substances	:	Not applicable
Mixture	:	This mixture does not contain any substances to be mentioned according to the criteria of section 3.2 of REACH annex ii
Hazardous Component	:	None
Main Ingredients :	:	Water, potassium carbonate & other materials.

4. FIRST AID MEASURES

Eye Contact	:	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice (S26)
Skin Contact	:	Wash off with water. Seek medical advice if needed.
Ingestion	:	If swallowed, rinse mouth with water. Seek medical advice if needed. (S64)
Inhalation	:	Not toxic by inhalation. Remove to fresh air. Seek medical advice if you feel sick.

5. FIRE FIGHTING MEASURES

Fire Hazards & Extinguishing Media	No danger of fire, product itself is fire extinguishing agent.
Explosion Hazards	Not explosive. The product itself does not burn.
Reactivity in Case of Fire	None
Hazardous Decomposition	None
Products in Case of Fire	None

DM Solutions

Saucepan Fire Extinguisher (SFE)

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions:
Do not get in eyes, on skin, or on clothing. Take appropriate protective measures.
Actions to be taken in case material is released or spilled:
Flush area with water.
Dispose of released and contained material in accordance with local regulations:

7. HANDLING AND STORAGE

Precautions	:	Avoid direct sunlight & extreme temperatures.
Storage Temperature	:	-20°C to 65°C
Heat and Ignition Sources	:	Remove all sources of ignition. Storage away from excessive heat.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

Exposure Control	:	Not required for normal conditions of use
Personal Protection	:	Wear mask if expose in high temperature.
Work / Hygienic Practices	:	Do not eat, drink or smoke when using this product. Practice safe workplace habits, clean hands after work.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form	:	Liquid
Odor	:	Odorless
Ph at 20°C	:	11.5 ±1.0
Density at 20°C	:	1.23 ±0.05
Solubility	:	Water soluble
Boiling Point	:	≥100°C
Flash Point	:	No flash point up to 100°C
Explosive Properties	:	Not explosive
Oxidizing Properties	:	Not oxidizing

10. STABILITY AND REACTIVITY

Stability	:	Stable under normal use and storage
Conditions to Avoid	:	Extreme temperatures
Hazardous Reactions	:	Not expected in normal conditions

11. TOXICOLOGICAL INFORMATION

Acute Toxicity	:	Not classified
Chronic Toxicity	:	None
Sensitive Skin and Eyes	:	May cause slight irritation to sensitive skin and Eyes

12. ECOLOGICAL DATA

Biodegradability	:	Readily biodegradable
Eco-toxic	:	Not classified as toxic

DM Solutions

Saucepan Fire Extinguisher (SFE)

13. DISPOSAL CONDITIONS

Waste Disposal Method	:	Not considered as a hazardous waste. Dispose after diluting with water
Decontamination / Cleaning:		Rinse with plenty of water
Regional Legislation (waste):		Disposal must be done according to official regulations.

14. TRANSPORT INFORMATION

Not labelled as hazardous material. The extinguishing agent is transported only in plastic sachets. No restriction for transportation of product.

UN Number	:	No dangerous good in sense of transport regulations
UN Proper Shipping Name	:	Not applicable
Transport Hazard Class (es)		Not applicable
RID/ADR	:	Not classified as a dangerous good under transport regulations.
ADNR/IMDG	:	Not classified as a dangerous good under transport regulations.
ICAO/IATA	:	Not classified as a dangerous good under transport regulations.

15/ REGULATORY INFORMATION

EU Regulations	:	No REACH Annex XVII restrictions. Contains no REACH candidate substance.
Chemical Safety Assessment:		This mixture is classified as non-hazardous according to regulation(EC) 1272/2008 (CLP)
Risk Phrases	:	Not classified
Hazard Symbol(s)	:	Not classified
R-phrase(s)	:	R36 (irritating to eyes)
S-phrase(s)	:	S20 (When using do not eat or drink)
	:	S25 (Avoid contact with eyes)
Safety Phrases	:	Not classified

16. OTHER INFORMATION

Disclaimer:

This information is based on our knowledge on this product as the date compiled. Use the described product only for specified purpose and it shall not be used to establish a legally valid contractual relationship. Supplier assumes no responsibility for injury caused by the material if reasonable safety procedures are not followed as stipulated in this MSDS. Supplier also assumes no responsibility for injury caused by abnormal use of the material even if reasonable safety procedures are followed.

APPENDIX C – MARKETING PAGE

Saucepan Fire Extinguisher (SFE)

Data Sheet

DM Solutions

Saucepan Fire Extinguishers (SFE) Sachets offers an easy, safe and effective way of extinguishing dangerous saucepan fires, within seconds by an untrained person.

The SFE Sachets react instantly with hot, burning cooking oil or fats by creating a chemical reaction to form a blanket of cooling foam that extinguishes the fire and prevents reignition.

Cooking oil and grease saucepan fires are the main cause of fires and fatalities within the kitchen accounting for approximately 20 serious incidents a day. Kitchen fires caused by the cooking oil can spread fast and Occupants are generally too paniced to handle the fire with appropriate mechanisms such as fire extinguishers and fire blankets. Delays in extinguishing the fire can cause the fire to spread and the loss of the property and injury to the Occupant.

SFE is a simple yet effective solution to stop cooking oil fires. Gently place the sachet into the burning oil saucepan to release the special extinguishing agent. The liquid chemically reacts with the cooking oil to form a foam layer on the surface which starves the oxygen and cools the cooking oil into a non-combustible liquid quickly extinguishing the fire.

Features

Safe and Easy to use on cooking hob fires.

Simply place SFE Sachet in saucepan & fire is extinguished.

Requires no training.

Extinguishes first stage of Class F cooking oil fires.

Non Hazardous EC 1999/45/EC.

European Union REACH compliant.

5 year shelf life.

Full scale tests carried out by Fire Consultants 'FDS Consult'.

SFE was developed based upon a requirement for a simple solution to a daily problem.

Installation

No installation required

Stick SFE box to the kitchen wall

Applications

Domestic kitchens, student accommodation, holiday homes, rental properties, office kitchens, caravans and yachts.

Specification

Product Name: Saucepan Fire Extinguisher (SFE).

Main ingredient : Potassium Carbonate

Corresponding Fire: Class F (cooking oil/fats) fire

Extinguishing Capacity: less than 1.5L cooking oil.

Lifespan: Printed on package

Box Dimensions: 110mm x 80mm x 18mm

View fire test demonstrations on our web site www.dmsolutions.co.uk