

3M™ Novec™ 1230 Fire Protection Fluid



Safety Data Sheet

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This Safety Data Sheet has been prepared in accordance with the REACH Regulation (EC) 1907/2006 and its modifications.

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

3M™ Novec™ 1230 Fire Protection Fluid

| REACH registration number | CASRN | EC Number | Ingredient Name |
|---------------------------|----------|------------------|--|
| 01-0000018239-65-0001 | 756-13-8 | ELINCS 436-710-6 | 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone |

Product Identification Numbers

98-0212-3203-2

7100010142

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses

Streaming and flooding fire protection

1.3. Details of the supplier of the safety data sheet

Address: 3M United Kingdom PLC, 3M Centre, Cain Road, Bracknell, Berkshire, RG12 8HT.
Telephone: +44 (0)1344 858 000
E Mail: tox.uk@mmm.com
Website: www.3M.com/uk

1.4. Emergency telephone number

+44 (0)1344 858 000

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

CLP REGULATION (EC) No 1272/2008

CLASSIFICATION:

Hazardous to the Aquatic Environment (Chronic), Category 3 - Aquatic Chronic 3; H412

For full text of H phrases, see Section 16.

2.2. Label elements

CLP REGULATION (EC) No 1272/2008

Ingredients:

| Ingredient | CAS Nbr | EC No. | % by Wt |
|--|----------|-----------|---------|
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | 756-13-8 | 436-710-6 | > 99.5 |

HAZARD STATEMENTS:

H412 Harmful to aquatic life with long lasting effects.

PRECAUTIONARY STATEMENTS

Disposal:

P501 Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

2.3. Other hazards

None known.

SECTION 3: Composition/information on ingredients

| Ingredient | CAS Nbr | EC No. | REACH Registration No. | % by Wt | Classification |
|--|----------|------------------|------------------------|---------|-------------------------|
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | 756-13-8 | ELINCS 436-710-6 | | > 99.5 | Aquatic Chronic 3, H412 |

Please see section 16 for the full text of any H statements referred to in this section

For information on ingredient occupational exposure limits or PBT or vPvB status, see sections 8 and 12 of this SDS

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation

Remove person to fresh air. If you feel unwell, get medical attention.

Skin contact

No need for first aid is anticipated.

Eye contact

Flush with large amounts of water. Remove contact lenses if easy to do. Continue rinsing. If signs/symptoms persist, get medical attention.

If swallowed

No need for first aid is anticipated.

4.2. Most important symptoms and effects, both acute and delayed

See Section 11.1 Information on toxicological effects

4.3. Indication of any immediate medical attention and special treatment required

Not applicable

SECTION 5: Fire-fighting measures

5.1. Extinguishing media

Use a fire fighting agent suitable for the surrounding fire.

5.2. Special hazards arising from the substance or mixture

Exposure to extreme heat can give rise to thermal decomposition.

Hazardous Decomposition or By-Products

| <u>Substance</u> | <u>Condition</u> |
|------------------|--------------------|
| Carbon monoxide | During combustion. |
| Carbon dioxide. | During combustion. |
| Toxic Vapour/Gas | During combustion. |

5.3. Advice for fire-fighters

When fire fighting conditions are severe and total thermal decomposition of the product is possible, wear full protective clothing, including helmet, self-contained, positive pressure or pressure demand breathing apparatus, tunic and trousers (leggings), bands around arms, waist and legs, face mask, and protective covering for exposed areas of the head.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapours, in accordance with good industrial hygiene practice. Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.

6.2. Environmental precautions

Avoid release to the environment. For larger spills, cover drains and build dykes to prevent entry into sewer systems or bodies of water.

6.3. Methods and material for containment and cleaning up

Contain spill. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Remember, adding an absorbent material does not remove a physical, health, or environmental hazard. Collect as much of the spilled material as possible. Place in a closed container approved for transportation by appropriate authorities. Clean up residue with an appropriate solvent selected by a qualified and authorised person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and Safety Data Sheet. Seal the container. Dispose of collected material as soon as possible.

6.4. Reference to other sections

Refer to Section 8 and Section 13 for more information

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Contents may be under pressure, open carefully. Avoid inhalation of thermal decomposition products. Avoid skin contact with hot material. For industrial/occupational use only. Not for consumer sale or use. Do not use in a confined area with minimal air exchange. Avoid release to the environment.

3M™ Novec™ 1230 Fire Protection Fluid**7.2. Conditions for safe storage including any incompatibilities**

Protect from sunlight. Store in a well-ventilated place. Store at temperatures not exceeding 38C/100F Store away from strong bases. Store away from amines.

7.3. Specific end use(s)

See information in Section 7.1 and 7.2 for handling and storage recommendations. See Section 8 for exposure controls and personal protection recommendations.

SECTION 8: Exposure controls/personal protection**8.1 Control parameters****Occupational exposure limits**

If a component is disclosed in section 3 but does not appear in the table below, an occupational exposure limit is not available for the component.

| Ingredient | CAS Nbr | Agency | Limit type | Additional comments |
|--|----------|-------------------------|--------------------------------------|---------------------|
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | 756-13-8 | Manufacturer determined | TWA:150 ppm(1940 mg/m ³) | |

UK HSC : UK Health and Safety Commission
TWA: Time-Weighted-Average
STEL: Short Term Exposure Limit
CEIL: Ceiling

Biological limit values

No biological limit values exist for any of the components listed in Section 3 of this safety data sheet.

Derived no effect level (DNEL)

| Ingredient | Degradation Product | Population | Human exposure pattern | DNEL |
|--|---------------------|------------|---|-----------------------------|
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | | Consumer | Inhalation, Long-term exposure (24 hours), Systemic effects | 580 mg/m ³ |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | | Consumer | Oral, Long-term exposure (24 hours), Systemic effects | 74 mg/kg bw/d |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | | Worker | Dermal, Long-term exposure (8 hours), Systemic effects | 147 mg/kg bw/d |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | | Worker | Inhalation, Long-term exposure (8 hours), Systemic effects | 780 mg/m ³ |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | | Worker | Inhalation, Short-term exposure, Systemic effects | 1,286,130 mg/m ³ |

Predicted no effect concentrations (PNEC)

| Ingredient | Degradation Product | Compartment | PNEC |
|---|-----------------------------------|-------------------|------------------|
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3- | Hydrogen Fluoride (CAS 7664-39-3) | Agricultural soil | 12.43 mg/kg d.w. |

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| | | | |
|--|--|----------------------|--------------------------|
| pentanone | | | |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Pentafluoropropanoic acid (CAS 422-64-0) | Agricultural soil | 0.006893 mg/kg d.w. |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Trifluoroacetic acid (CAS 76-05-1) | Agricultural soil | 0.0113 mg/kg d.w. |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Hydrogen Fluoride (CAS 7664-39-3) | Air during emission | 0.0002 mg/m ³ |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Hydrogen Fluoride (CAS 7664-39-3) | Freshwater | 0.9 mg/l |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Pentafluoropropanoic acid (CAS 422-64-0) | Freshwater | 0.0085 mg/l |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Trifluoroacetic acid (CAS 76-05-1) | Freshwater | 0.0077 mg/l |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Hydrogen Fluoride (CAS 7664-39-3) | Freshwater sediments | 4.692 mg/kg d.w. |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Pentafluoropropanoic acid (CAS 422-64-0) | Freshwater sediments | 0.03082 mg/kg d.w. |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Trifluoroacetic acid (CAS 76-05-1) | Freshwater sediments | 0.0276 mg/kg d.w. |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Hydrogen Fluoride (CAS 7664-39-3) | Grassland average | 12.43 mg/kg d.w. |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Pentafluoropropanoic acid (CAS 422-64-0) | Grassland average | 0.006893 mg/kg d.w. |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Trifluoroacetic acid (CAS 76-05-1) | Grassland average | 0.0113 mg/kg d.w. |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Hydrogen Fluoride (CAS 7664-39-3) | Marine water | 0.09 mg/l |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4- | Pentafluoropropanoic acid (CAS 422-64- | Marine water | 0.00085 mg/l |

| | | | |
|--|--|------------------------|---------------------|
| (trifluoromethyl)-3-pentanone | 0) | | |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Trifluoroacetic acid (CAS 76-05-1) | Marine water | 0.00077 mg/l |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Hydrogen Fluoride (CAS 7664-39-3) | Marine water sediments | 0.4692 mg/kg d.w. |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Pentafluoropropanoic acid (CAS 422-64-0) | Marine water sediments | 0.003082 mg/kg d.w. |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Trifluoroacetic acid (CAS 76-05-1) | Marine water sediments | 0.00276 mg/kg d.w. |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Hydrogen Fluoride (CAS 7664-39-3) | Sewage Treatment Plant | 51 mg/l |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Pentafluoropropanoic acid (CAS 422-64-0) | Sewage Treatment Plant | 1,000 mg/l |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Trifluoroacetic acid (CAS 76-05-1) | Sewage Treatment Plant | 1 mg/l |

Recommended monitoring procedures: Information on recommended monitoring procedures can be obtained from UK HSC

8.2. Exposure controls

In addition, refer to the annex for more information.

8.2.1. Engineering controls

Provide appropriate local exhaust when product is heated. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below relevant Exposure Limits and/or control dust/fume/gas/mist/vapours/spray. If ventilation is not adequate, use respiratory protection equipment.

8.2.2. Personal protective equipment (PPE)

Eye/face protection

Eye protection not required.

Skin/hand protection

Select and use gloves and/or protective clothing approved to relevant local standards to prevent skin contact based on the results of an exposure assessment. Selection should be based on use factors such as exposure levels, concentration of the substance or mixture, frequency and duration, physical challenges such as temperature extremes, and other use conditions. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible gloves/protective clothing.

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Gloves made from the following material(s) are recommended:

| Material | Thickness (mm) | Breakthrough Time |
|-----------|-------------------|-------------------|
| Neoprene. | No data available | No data available |

Applicable Norms/Standards

Use gloves tested to EN 374

If this product is used in a manner that presents a higher potential for exposure (eg. spraying, high splash potential etc.), then use of protective coveralls may be necessary. Select and use body protection to prevent contact based on the results of an exposure assessment. The following protective clothing material(s) are recommended: Neoprene apron.

Respiratory protection

During heating:

Use a positive pressure supplied-air respirator if there is a potential for over exposure from an uncontrolled release, exposure levels are not known, or under any other circumstances where air-purifying respirators may not provide adequate protection.

Thermal hazards

Wear heat insulating gloves when handling hot material to prevent thermal burns.

Applicable Norms/Standards

Use gloves tested to EN 407

8.2.3. Environmental exposure controls

Refer to Annex

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance

Physical state
Colour

Liquid.
Colourless

Specific Physical Form:

Odor

Liquid.
Low Odor

Odour threshold

No data available.

pH

Not applicable.

Boiling point/boiling range

49 °C [*@ 101,324.72 Pa*]

Melting point

-108 °C

Flammability (solid, gas)

Not applicable.

Explosive properties

Not classified

Oxidising properties

Not classified

Flash point

No flash point

Autoignition temperature

Not applicable.

Flammable Limits(LEL)

None detected

Flammable Limits(UEL)

None detected

Vapour pressure

40.4 kPa [*@ 25 °C*]

Relative density

1.6 [*@ 20 °C*] [*Ref Std: WATER=1*]

Water solubility

Nil

Solubility- non-water

No data available.

Partition coefficient: n-octanol/water

No data available.

Evaporation rate

> 1 [*Ref Std: BUOAC=1*]

Vapour density

11.6 [*Ref Std: AIR=1*]

| | |
|----------------------------------|---------------------------|
| Decomposition temperature | <i>No data available.</i> |
| Viscosity | 0.6 mPa-s [@ 25 °C] |
| Density | 1.6 g/ml |

9.2. Other information

| | |
|--------------------------------------|---------------------------|
| EU Volatile Organic Compounds | 1,600 g/l |
| Molecular weight | <i>No data available.</i> |
| Percent volatile | 100 % |

SECTION 10: Stability and reactivity

10.1 Reactivity

This material may be reactive with certain agents under certain conditions - see the remaining headings in this section

10.2 Chemical stability

Stable.

10.3 Possibility of hazardous reactions

Hazardous polymerisation will not occur.

10.4 Conditions to avoid

Light.

10.5 Incompatible materials

Strong bases.

Amines.

Alcohols.

10.6 Hazardous decomposition products

| <u>Substance</u> | <u>Condition</u> |
|------------------|------------------|
|------------------|------------------|

| | |
|-------------------|--|
| Hydrogen Fluoride | At elevated temperatures. - extreme conditions of heat |
|-------------------|--|

Refer to section 5.2 for hazardous decomposition products during combustion.

If the product is exposed to extreme conditions of heat from misuse or equipment failure, toxic decomposition products that include hydrogen fluoride and perfluoroisobutylene can occur. Extreme heat arising from situations such as misuse or equipment failure can generate hydrogen fluoride as a decomposition product.

SECTION 11: Toxicological information

The information below may not agree with the EU material classification in Section 2 and/or the ingredient classifications in Section 3 if specific ingredient classifications are mandated by a competent authority. In addition, statements and data presented in Section 11 are based on UN GHS calculation rules and classifications derived from 3M assessments.

11.1 Information on Toxicological effects

Signs and Symptoms of Exposure

Based on test data and/or information on the components, this material may produce the following health effects:

Inhalation

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Vapours from heated material may cause irritation of the respiratory system: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, nose and throat pain.

Skin contact

Contact with the skin during product use is not expected to result in significant irritation.

Eye contact

Vapours from heated material may cause eye irritation: Signs/symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision.

Ingestion

No known health effects.

Toxicological Data

If a component is disclosed in section 3 but does not appear in a table below, either no data are available for that endpoint or the data are not sufficient for classification.

Acute Toxicity

| Name | Route | Species | Value |
|--|-----------------------------|------------------------|------------------------------------|
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Dermal | Professional judgement | LD50 estimated to be > 5,000 mg/kg |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Ingestion | Professional judgement | LD50 estimated to be > 5,000 mg/kg |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Inhalation-Vapour (4 hours) | Rat | LC50 > 1,227 mg/l |

ATE = acute toxicity estimate

Skin Corrosion/Irritation

| Name | Species | Value |
|--|---------|---------------------------|
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Rabbit | No significant irritation |

Serious Eye Damage/Irritation

| Name | Species | Value |
|--|---------|---------------------------|
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Rabbit | No significant irritation |

Skin Sensitisation

| Name | Species | Value |
|--|------------|----------------|
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Guinea pig | Not classified |

Respiratory Sensitisation

For the component/components, either no data is currently available or the data is not sufficient for classification.

Germ Cell Mutagenicity

| Name | Route | Value |
|--|----------|---------------|
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | In Vitro | Not mutagenic |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | In vivo | Not mutagenic |

Carcinogenicity

For the component/components, either no data is currently available or the data is not sufficient for classification.

3M™ Novec™ 1230 Fire Protection Fluid**Reproductive Toxicity****Reproductive and/or Developmental Effects**

| Name | Route | Value | Species | Test result | Exposure Duration |
|--|------------|--|---------|--------------------|--------------------------------|
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Inhalation | Not classified for female reproduction | Rat | NOAEL 3,000 ppm | prematuring & during gestation |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Inhalation | Not classified for male reproduction | Rat | NOAEL 3,000 ppm | prematuring & during gestation |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Inhalation | Not classified for development | Rat | NOAEL 3,000 ppm | prematuring & during gestation |

Target Organ(s)**Specific Target Organ Toxicity - single exposure**

| Name | Route | Target Organ(s) | Value | Species | Test result | Exposure Duration |
|--|------------|-----------------------|----------------|---------|---------------------------|-------------------|
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Inhalation | nervous system | Not classified | Rat | NOAEL 100,000 ppm | 2 hours |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Inhalation | cardiac sensitisation | Not classified | Dog | Sensitization Negative | 17 minutes |

Specific Target Organ Toxicity - repeated exposure

| Name | Route | Target Organ(s) | Value | Species | Test result | Exposure Duration |
|--|------------|---|----------------|---------|--------------------|-------------------|
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | Inhalation | liver kidney and/or bladder heart endocrine system hematopoietic system muscles nervous system respiratory system vascular system | Not classified | Rat | NOAEL 3,000 ppm | 90 days |

Aspiration Hazard

For the component/components, either no data is currently available or the data is not sufficient for classification.

Please contact the address or phone number listed on the first page of the SDS for additional toxicological information on this material and/or its components.

SECTION 12: Ecological information

The information below may not agree with the EU material classification in Section 2 and/or the ingredient classifications in Section 3 if specific ingredient classifications are mandated by a competent authority. In addition, statements and data presented in Section 12 are based on UN GHS calculation rules and classifications derived from 3M assessments.

12.1. Toxicity

No product test data available.

| Material | CAS # | Organism | Type | Exposure | Test endpoint | Test result |
|----------|-------|----------|------|----------|---------------|-------------|
|----------|-------|----------|------|----------|---------------|-------------|

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| | | | | | | |
|--|----------|--------------------|--------------|----------|------|-------------|
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | 756-13-8 | Water flea Daphnid | Experimental | 48 hours | EC50 | >1,080 mg/l |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | 756-13-8 | Green algae | Experimental | 96 hours | LC50 | 10.6 mg/l |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | 756-13-8 | Fathead minnow | Experimental | 96 hours | LC50 | >1,070 mg/l |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | 756-13-8 | Green algae | Experimental | 96 hours | NOEC | 3.71 mg/l |

12.2. Persistence and degradability

| Material | CAS Nbr | Test type | Duration | Study Type | Test result | Protocol |
|--|----------|---|----------|-------------------------------|----------------------|-----------------------------------|
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | 756-13-8 | Experimental Photolysis | | Photolytic half-life (in air) | 7.3 days (t 1/2) | Other methods |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | 756-13-8 | Experimental Aquatic Biodegrad. - Aerobic | 28 days | CO2 evolution | 3 % weight | OECD 301B - Modified sturm or CO2 |
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | 756-13-8 | Experimental Hydrolysis | | Hydrolytic half-life | <2.5 minutes (t 1/2) | Other methods |

12.3 : Bioaccumulative potential

| Material | Cas No. | Test type | Duration | Study Type | Test result | Protocol |
|--|----------|-----------------------|----------|------------------------|-------------|--|
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | 756-13-8 | Experimental BCF-Carp | 28 days | Bioaccumulation factor | <4.8 | OECD 305E - Bioaccumulation flow-through fish test |

12.4. Mobility in soil

Please contact manufacturer for more details

12.5. Results of the PBT and vPvB assessment

This material does not contain any substances that are assessed to be a PBT or vPvB

12.6. Other adverse effects

| Material | CAS Nbr | Ozone Depletion Potential | Global Warming Potential |
|--|----------|---------------------------|--------------------------|
| 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone | 756-13-8 | 0 | |

SECTION 13: Disposal considerations**13.1 Waste treatment methods**

Dispose of contents/ container in accordance with the local/regional/national/international regulations.

Dispose of waste product in a permitted industrial waste facility. As a disposal alternative, incinerate in a permitted waste incineration facility. Proper destruction may require the use of additional fuel during incineration processes. Combustion

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products will include HF. Facility must be capable of handling halogenated materials. Empty drums/barrels/containers used for transporting and handling hazardous chemicals (chemical substances/mixtures/preparations classified as Hazardous as per applicable regulations) shall be considered, stored, treated & disposed of as hazardous wastes unless otherwise defined by applicable waste regulations. Consult with the respective regulating authorities to determine the available treatment and disposal facilities.

The coding of a waste stream is based on the application of the product by the consumer. Since this is out of the control of 3M, no waste code(s) for products after use will be provided. Please refer to the European Waste Code (EWC - 2000/532/EC and amendments) to assign the correct waste code to your waste stream. Ensure national and/or regional regulations are complied with and always use a licensed waste contractor.

EU waste code (product as sold)

| | |
|-----------|--|
| 070103* | Organic halogenated solvents, washing liquids and mother liquors |
| 14 06 02* | Other halogenated solvents and solvent mixtures |

SECTION 14: Transportation information

98-0212-3203-2

Not hazardous for transportation

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

15.2. Chemical Safety Assessment

A chemical safety assessment has been carried out for this substance/mixture in accordance with Regulation (EC) No 1907/2006, as amended.

SECTION 16: Other information

List of relevant H statements

H412 Harmful to aquatic life with long lasting effects.

Revision information:

Deluge in Fire Emergencies: Section 16: Annex information was modified.

Industrial Use in Closed Systems: Section 16: Annex information was modified.

Professional Use in Closed Systems: Section 16: Annex information was modified.

Section 1: REACH registration number information was modified.

CLP: Ingredient table information was modified.

Section 3: Composition/ Information of ingredients table information was modified.

Section 4: First aid for inhalation information information was modified.

Section 4: First aid for skin contact information information was modified.

Section 5: Fire - Extinguishing media information information was modified.

Section 5: Hazardous combustion products table information was modified.

Section 6: Accidental release clean-up information information was modified.

Section 6: Accidental release personal information information was modified.

Section 7: Conditions safe storage information was modified.

Section 7: Precautions safe handling information information was modified.

Section 8: Appropriate Engineering controls information information was modified.

Section 8: DNEL table row information was modified.
 Section 8: glove data value information was added.
 Section 8: Occupational exposure limit table information was modified.
 Section 8: Personal Protection - Respiratory Information information was modified.
 Section 8: Personal Protection - Skin/body information information was added.
 Section 8: Personal Protection - Skin/hand information information was modified.
 Section 8: Personal Protection - Thermal hazards information information was added.
 Section 8: PNEC table row information was modified.
 Section 8: Skin protection - protective clothing information information was added.
 Section 8: Skin protection - recommended gloves text information was added.
 Section 09: Color information was added.
 Section 09: Odor information was added.
 Sections 3 and 9: Odour, colour, grade information information was deleted.
 Section 11: Acute Toxicity table information was modified.
 Section 11: Germ Cell Mutagenicity Table information was modified.
 Section 11: Health Effects - Eye information information was modified.
 Section 11: Health Effects - Inhalation information information was modified.
 Section 11: Reproductive and/or Developmental Effects text information was deleted.
 Section 11: Reproductive Toxicity Table information was modified.
 Section 11: Serious Eye Damage/Irritation Table information was modified.
 Section 11: Skin Corrosion/Irritation Table information was modified.
 Section 11: Skin Sensitization Table information was modified.
 Section 11: Target Organs - Repeated Table information was modified.
 Section 11: Target Organs - Single Table information was modified.
 Section 12: Component ecotoxicity information information was modified.
 Section 12: Persistence and Degradability information information was modified.
 Section 12: Bioaccumulative potential information information was modified.
 Section 13: 13.1. Waste disposal note information was modified.
 Section 13: Standard Phrase Category Waste GHS information was modified.
 Section 15: Regulations - Inventories information was deleted.
 Section 16: UK disclaimer information was deleted.

Annex

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| 1. Title | |
| Substance identification | 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone; EC No. 436-710-6; CAS Nbr 756-13-8; |
| Exposure Scenario Name | Deluge in Fire Emergencies |
| Lifecycle Stage | Widespread use by professional workers |
| Contributing activities | PROC 11 -Non industrial spraying ERC 08b -Widespread use of reactive processing aid (no inclusion into or onto article, indoor) |
| Processes, tasks and activities covered | Spraying during a fire. |
| 2. Operational conditions and risk management measures | |
| Operating Conditions | Physical state: Liquid. General operating conditions: Duration of exposure per day at workplace [for one worker]: < 15 min task; Frequency of exposure at workplace [for one worker]; Indoor use without Local Exhaust Ventilation; Intermittent release; Medium sized room or workshop (100 m ³ - 500 m ³); |
| Risk management measures | Under the operational conditions described above the following risk management measures apply: |

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| | General risk management measures: Human health: None needed; Environmental: None needed; |
| Waste management measures | Do not release to waterways or sewers; Incinerate in a permitted hazardous waste incinerator; |
| 3. Prediction of exposure | |
| Prediction of exposure | Human and environmental exposures are not expected to exceed the DNELs and PNECs when the identified risk management measures are adopted. Contact 3M at the address or phone number listed on the first page of the SDS for information on exposure estimation. |

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|---|---|
| 1. Title | |
| Substance identification | 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone; EC No. 436-710-6; CAS Nbr 756-13-8; |
| Exposure Scenario Name | Industrial Use in Closed Systems |
| Lifecycle Stage | Use at industrial sites |
| Contributing activities | PROC 01 -Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. ERC 01 -Manufacture of the substance ERC 07 -Use of functional fluid at industrial site |
| Processes, tasks and activities covered | Charging material in closed systems with minimal opportunity for exposure. Use as heat transfer fluids. |
| 2. Operational conditions and risk management measures | |
| Operating Conditions | Physical state: Liquid. General operating conditions: Closed process; Duration of exposure per day at workplace [for one worker]: 8 hours/day; Fraction of applied product lost from process/use to waste: 980,030 kg; Fraction of applied product lost from process/use to waste gas: 0.0001 ; Fraction of applied product lost from process/use to waste water: 0 ; Frequency of exposure at workplace [for one worker]: 220 days/year; Indoor use without Local Exhaust Ventilation; Intermittent release; Large factory building (> 500 m ³); |
| Risk management measures | Under the operational conditions described above the following risk management measures apply: General risk management measures: Human health: None needed; Environmental: None needed; |
| Waste management measures | Do not release to waterways or sewers; Incinerate in a permitted hazardous waste incinerator; |
| 3. Prediction of exposure | |
| Prediction of exposure | Human and environmental exposures are not expected to exceed the DNELs and PNECs when the identified risk management measures are adopted. Contact 3M at the address or phone number listed on the first page of the SDS for information on exposure estimation. |

1. Title

3M™ Novec™ 1230 Fire Protection Fluid

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|---|---|
| Substance identification | 1,1,1,2,2,4,5,5,5-nonafluoro-4-(trifluoromethyl)-3-pentanone; EC No. 436-710-6; CAS Nbr 756-13-8; |
| Exposure Scenario Name | Professional Use in Closed Systems |
| Lifecycle Stage | Widespread use by professional workers |
| Contributing activities | PROC 01 -Chemical production or refinery in closed process without likelihood of exposure or processes with equivalent containment conditions. ERC 09a -Widespread use of functional fluid (indoor) |
| Processes, tasks and activities covered | Draining material from closed systems. |
| 2. Operational conditions and risk management measures | |
| Operating Conditions | Physical state: Liquid. General operating conditions: Closed process; Duration of exposure per day at workplace [for one worker]: 8 hours/day; Frequency of exposure at workplace [for one worker]: 220 days/year; Intermittent release; Outdoor use; |
| Risk management measures | Under the operational conditions described above the following risk management measures apply: General risk management measures: Human health: None needed; Environmental: None needed; |
| Waste management measures | Do not release to waterways or sewers; Incinerate in a permitted hazardous waste incinerator; |
| 3. Prediction of exposure | |
| Prediction of exposure | Human and environmental exposures are not expected to exceed the DNELs and PNECs when the identified risk management measures are adopted. Contact 3M at the address or phone number listed on the first page of the SDS for information on exposure estimation. |

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