



**Nu-Film-17®**

**Safety Data Sheet According to Regulation (EC) 1907/2006 as amended**

**Section 1: Identification of the substance/mixture and of the company/undertaking**

1.1 Product identifier

**Product form:** Mixture

**Product Name:** Nu-Film-17®

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

*1.2.1 Relevant identified uses*

**Intended use:** Agricultural/horticultural spray adjuvant.

*1.2.2. Uses advised against*

All uses which are not covered by the attached exposure scenarios in Annex 1

1.3 Details of the supplier of the safety data sheet

**Manufacturer:** Miller Chemical & Fertilizer LLC

P.O. Box 333, Radio Road,  
Hanover, Pennsylvania 17331, USA.

**Email:** andysmith@millerchemical.com

**Telephone number:** +44 (0) 7771 893 006 (not 24h)

1.4 Emergency telephone number

+44 (0) 7771 893 006 (not 24h)

**Section 2: Hazards identification**

2.1 Classification of the substance or mixture

**CLP Classification (Regulation (EC) 1272/2008):**

- Skin Irritant Category 2; H315
- Skin Sensitisation Category 1; H317
- Aquatic Acute Category 1; H400
- Aquatic Chronic Category 1; H410

2.2 Label elements

Hazard pictograms:





Signal word: WARNING

Hazard Statements:

H315 Causes skin irritation

H317 May cause an allergic skin reaction

H410 Very toxic to aquatic life with long-lasting effects

Precautionary statements:

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

P302 + P352 If on skin: Wash with plenty of water/soap.

P333 + P313 If skin irritation or rash occurs: Get medical advice/attention.

P362 Take off contaminated clothing.

P391 Collect spillage

P501 Dispose of container as hazardous waste

2.3 Other hazards

The properties of the main component do not meet the specific criteria detailed in Annex XIII of Regulation (EC) No. 1907/2006 or do not allow a direct comparison with all the criteria in Annex XIII, but nevertheless indicate that the main component would not have PBT/vPvB properties so the main component is not considered a PBT/vPvB.

**Section 3: Composition/information on ingredients**3.2 Mixtures

Component	CAS RN	EC No.	REACH Registration No.	Concentration (% w/w)	Classification: CLP 1272/2008
Oligomerisation products of beta-pinene	Not available	701-246-8	01-2119488053-38	96	Skin Irritant Cat. 2, H315 Skin Sens. Cat. 1, H317 Aquatic Acute Cat. 1, H400 Aquatic Chronic Cat. 1, H410
Alcohols, C12-16, ethoxylated	68551-12-2	-	Polymer (not subject to registration)	1 – 2.5	Eye damage Cat.1, H318 Aquatic acute Cat. 1. H400
Benzenesulfonic acid, C10-13-alkyl derivs., calcium salt	1335202-81-7	932-231-6	01-2119560592-37	0.5 – 1.5	Eye damage Cat. 1, H318 Skin irritant Cat.2, H315



#### Section 4: First aid measures

4.1 Description of first aid measures

**Eye contact:** Flush immediately with copious amounts of water or saline, including under eyelids.

**Skin contact:** Wash affected area with soap and water

**Inhalation:** Remove promptly to air. If not breathing, administer artificial respiration. Administer oxygen if breathing is difficult.

**Ingestion:** Do not induce vomiting and seek immediate medical assistance from a doctor.

4.2 Most important symptoms and effects

Localised skin irritation or contact sensitisation may be possible following significant, prolonged or repeated skin contact.

4.3 Indication of any immediate medical attention and special treatment needed

If ingestion occurs seek immediate medical assistance from a doctor.

#### Section 5: Fire fighting measures

5.1 Extinguishing media

Suitable extinguishing media: Dry powder, carbon dioxide, foam

Unsuitable extinguishing media: None specified

5.2 Special hazards arising from the substance or mixture

None known, but may produce oxides of carbon

5.3 Advice for fire-fighters

Full protection by suitable clothing and positive pressure, self-contained breathing apparatus.

#### Section 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Wear suitable personal protection as specified in section 8.2.

6.2 Environmental precautions

Contain spillage. Avoid contamination of surface waters or release into drains.

**6.3 Methods and material for containment and cleaning up**

Collect spillage directly or after absorption into dry sand or other suitable material.

**6.4 Reference to other sections**

Not applicable

**Section 7: Handling and storage****7.1 Precautions for safe handling**

When mixing spray formulations, avoid splashing/aerosol generation. When spraying diluted formulation, observe all specified restrictions and wear appropriate protective equipment: see section 7.3.

**7.2 Conditions for safe storage, including any incompatibilities**

Store and use in the open air, or in well ventilated areas.

Store in tightly sealed containers.

Store at ambient temperatures.

**7.3 Specific end use(s)**

Spray application onto agricultural or horticultural crops: spray away from surface waters. **See Annex 1 for specific risk management measures**, including no-spray buffer zones.

**Section 8: Exposure controls/personal protection****8.1 Control parameters**

No occupational exposure limits have been established. DNEL and PNEC values for oligomerisation products of beta-pinene are given below:

Worker Derived No-Effect Level (DNEL) values:

- **Inhalation:** 2493 mg/m<sup>3</sup> (acute, systemic), 12.2 mg/m<sup>3</sup> (chronic, systemic)

- **Dermal:** 1526 mg/kg/day (acute, systemic), 3.47 mg/kg/day (chronic, systemic)

General population Derived No-Effect Level (DNEL) values:

- **Inhalation:** 1772 mg/m<sup>3</sup> (acute, systemic), 3.63 mg/m<sup>3</sup> (chronic, systemic)

- **Dermal:** 727 mg/kg/day (acute, systemic), 2.08 mg/kg/day (chronic, systemic)

Predicted No-Effect Concentration (PNEC) values:

PNEC<sub>Freshwater</sub>: 2 µg/l

PNEC<sub>Intermittent</sub>: 2.4 µg/l

PNEC<sub>STP</sub>: 1000 µg/l

PNEC<sub>Freshwater Sediment</sub>: 1.26 mg/kg dw



PNEC<sub>Soil</sub>: 1 mg/kg dw  
PNEC<sub>Oral</sub>: 33.3 mg/kg

## 8.2 Exposure controls

**Engineering controls:** not applicable (mix in the open or a well-ventilated work area).

**Eye/face protection:** Use goggles/glasses with sideshield (e.g. EN166), or full-face respirator.

**Skin/hand protection:** Use impermeable gloves (e.g. EN374, nitrile) and wear suitable protective clothing (e.g. EN368 chemical protection suit).

**Respiratory protection:** Use respiratory protection with vapour/aerosol filter cartridges e.g. EN405 FFA1 half-face respirator or EN136 full-face respirator).

## Section 9: Physical and Chemical properties

### 9.1 Information on basic physical and chemical properties

- **Appearance:** Yellow viscous liquid
- **Odour:** not specified
- **Odour threshold:** not specified
- **pH:** 7.5 – 7.7 at solubility limit in water
- **Melting point/freezing point:** < -12 °C (oligomerisation products of beta-pinene)
- **Initial boiling point:** 325 °C
- **Flash point:** > 100 °C (not considered flammable)
- **Evaporation rate:** not specified
- **Flammability (solid, gas):** property does not apply to a liquid
- **Upper/lower flammability or explosive limits:** not specified
- **Vapour pressure:** 0.0212 Pa at 25 °C
- **Relative density:** 0.924 – 0.936 g/cm<sup>3</sup> at 20 °C
- **Solubility:** 8.84E-04 g/l at 20 °C in water (oligomerisation products of beta-pinene)
- **Partition coefficient, n-octanol/water:** > 6.5 at 30 °C (oligomerisation products of beta-pinene)
- **Auto-ignition temperature:** 268 °C
- **Viscosity:** 1400 – 2500 cps at 23 °C
- **Explosive properties:** Chemical structure suggests no explosive properties
- **Oxidising properties:** Chemical structure suggests no oxidising properties

## Section 10: Stability and reactivity

### 10.1 Reactivity

Not considered chemically reactive

### 10.2 Chemical stability



Stable under normal ambient conditions and under the anticipated conditions of use

- 10.3 Possibility of hazardous reactions  
None known
- 10.4 Conditions to avoid  
None known
- 10.5 Incompatible materials  
None known
- 10.6 Hazardous decomposition products  
None known

## Section 11: Toxicological information

### 11.1 Information in toxicological effects

**Acute toxicity:** low

- Inhalation LC50: >4.43 mg/l (rat, OECD 403 study)
- Dermal LD50: > 4000 mg/kg (rat, OECD 402 study)
- Oral LD50: > 16000 mg/kg rat, OECD 401 study)

**Skin corrosion/irritation:** Irritant (in rabbit study following EPA OPP 81-5).

**Serious eye damage/irritation:** Non-irritant (in rabbit study following EPA OPP 81-4).

**Respiratory or skin sensitisation:** did not cause contact sensitisation in Guinea pigs (OECD 406 Enhanced Buehler test) or human volunteers (Closed Patch Test in 53 volunteers: oligomerisation products of beta-pinene tested). Positive in Guinea Pig maximisation test (EU Method B.6), which used intradermal injection and adjuvant (immune system stimulant). Risk of dermal sensitisation for man therefore uncertain, but classified as sensitising.

**Germ cell mutagenicity:** negative in vitro (Ames test, OECD 471 and cytogenetic test, OECD 473). Negative in vivo (mouse micronucleus test, EU Method B.12 and rat liver UDS test, OECD486).

**Carcinogenicity:** predicted not carcinogenic (based on read-across to close chemical analogue, rat and mouse oral oncogenicity studies).

**Reproductive toxicity:** Not considered to cause reprotoxic effects (based on read-across to close chemical analogues, rat and rabbit oral studies).



**STOT-single exposure:** acute studies revealed no toxic effects at doses up to 16000 mg/kg in rats.

**STOT-repeated exposure:** in a 4-week rat study, no toxic effects were observed at 1000 mg/kg (rats, OECD guideline 407).

**Aspiration hazard:** Not considered to be an aspiration hazard.

## Section 12: Ecological information

### 12.1 Toxicity

Acute toxicity to fish:

- *Oncorhynchus mykiss*, (OECD guideline 203) 96h LC50: 5.7 mg/l
- *Oncorhynchus mykiss*, (OECD guideline 203) 96h LC50: 7.5 mg/l
- *Oncorhynchus mykiss*, (OECD guideline 203) 96h LC50: > 6.5 mg/l

Acute toxicity to aquatic invertebrates:

- *Daphnia magna*, (OECD guideline 202) 48h EC50: 0.26 mg/l
- *Daphnia magna*, (EU Method C.2) 48h EC50:  $\geq 2.16$  -  $\leq 9.74$  mg/l

Toxicity to algae:

- *Pseudokirchnerella subcapitata*, (OECD guideline 201) 72h ErC50: 0.24 mg/l, 72h EbC50: 0.18 mg/l, 72h NOEC: 0.1 mg/l.

Toxicity to bacteria:

- Activated sludge (growth inhibition), (OECD guideline 209) EC50: >100 mg/l

Chronic toxicity to aquatic invertebrates:

- *Daphnia magna*, 21d NOEC: 0.12 mg/l (read-across to close chemical analogue)
- *Daphnia magna*, 21d NOEC: 0.27 mg/l (read-across to close chemical analogue)

Aqueous spray application onto water surface (giving nominal test water concentrations 10.7 mg/l *Daphnia*, 25 mg/l fish) at approximately 1 g/sq.m water surface caused no evident toxicity in fish. In *Daphnia* physical entrapment and a maximum of 40% immobilisation was observed.

Toxicity to soil macroorganisms except arthropods:

- *Eisenia fetida*, 14d LC50: > 1000 mg/kg

Toxicity to honeybees:

- *Apis mellifera* 48h LD50: > 200 µg per animal (for both ingestion and direct contact)

Toxicity to terrestrial plants:



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- No adverse effects were observed after spray application of the substance to orange trees, grapevines and cereal crops (wheat and barley).

#### 12.2 Persistence and degradability

Not readily biodegradable: 8% degradation over 28 days in OECD 301D Closed Bottle test. Not rapidly biodegraded in a test for inherent biodegradability (3% degradation over 28 days, OECD 301B method using acclimated, mixed soil/sludge inoculum). Slow biodegradation predicted, based on chemical analogy to ubiquitous phytoterpenes.

#### 12.3 Bioaccumulative potential

Not determined experimentally. QSAR calculations of BCF based on chemical structure and physical properties give BCF values of 175 (based on QSAR-estimated log Kow, 9.29) and 6295 (based on log Kow 6.5). BCF indicator for bioaccumulation is concluded to be >2000 but <5000.

#### 12.4 Mobility in soil

**Koc:** >28840 (Log Koc: >4.46)

**Method:** HPLC estimation method

**Remarks:** Oligomerisation products of beta-pinene are expected to bind strongly to organic matter.

#### 12.5 Results of PBT and vPvB assessment

Oligomerisation products of beta-pinene are not considered to be persistent, bioaccumulating or toxic (neither PBT or vPvB).

#### 12.6 Other Adverse effects

None known.

### Section 13: Disposal considerations

#### 13.1 Waste treatment methods

National, local and EU regulations concerning waste disposal must be respected. Disposal by incineration is recommended.

### Section 14: Transport information

#### 14.1 UN number

UN 3082

#### 14.2 UN proper shipping name

Environmentally Hazardous Substance, Liquid, N.O.S. (Oligomerisation products of beta-pinene)

#### 14.3 Transport hazard class(es)





Class 9 hazard diamond applies

- 14.4 Packing group  
Packing group III
- 14.5 Environmental hazards  
Environmentally hazardous substance: Marine Pollutant
- 14.6 Special precautions for user  
None known
- 14.7 Transport in bulk  
Drums with non-removable heads should be used if containers holding more than 250 litres are shipped.

#### **Section 15: Regulatory information**

- 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture  
No substance-specific regulations apply.
- 15.2 Chemical safety assessment  
A chemical safety assessment has been carried out for oligomerisation products of beta-pinene. Exposure scenarios for the two supported product uses (mixing and spray applications) are attached as Annex 1 to this safety data sheet.

#### **Section 16: Other information**

- 16.1 Section changes: SDS version 4 to version 5  
  
Section 3.2: A change to a constituents name and identifiers has been made in line with a request from ECHA. The name has been changed throughout the SDS where appropriate.  
Section 16.3: Brief information is included to provide information on the name and identifier change to the main constituent.
- 16.2 List of H-statements (full text)  
H315 Causes skin irritation  
H317 May cause an allergic skin reaction  
H318 Causes serious eye damage  
H400 Very toxic to aquatic life  
H410 Very toxic to aquatic life with long-lasting effects
- 16.3 Information on changes to the identity of the main constituent



At the request of the European Chemicals Agency (ECHA), the substance name and identifier for the main component (di-L-para-menthene) were amended in Q1 2018 as follows:

Identifiers - Old			Identifiers – New		
EC/List Number	CAS Number	IUPAC/chemical name	EC/List Number	CAS Number	IUPAC/chemical name
417-870-6	34363-01-4	di-L-para-menthene	701-246-8	Not available	Oligomerisation products of beta-pinene

This amendment does not imply any changes to the substance composition itself which remains the same.



**Disclaimer**

The information given in this Safety Data Sheet is believed to be accurate at the time of its preparation and has been prepared as required by Regulation 830/2015. However Miller Chemical & Fertilizer LLC, as issuer and supplier of this Safety Data Sheet, gives no warranty relating to its accuracy or completeness. Conditions of handling, storage, use and disposal of the product are beyond the supplier's control: accordingly we assume no responsibility, and expressly disclaim liability, for loss, damage, or expense arising out of, or in any way whatsoever connected with, handling, storage, use, or disposal of this product.

**Annex 1: Exposure Scenarios**

These follow on pages 11 – 13.



<b>Oligomerisation products of beta-pinene - Exposure Scenario for Identified Use 1</b>	
<b>1. Scenario title IU1 – ES.</b>	
<b>Scenario descriptor</b>	Industrial formulation
<b>2. Processes and activities covered by this exposure scenario</b>	
General description	Workers repackaging or mixing supplied pinene oligomer products with other liquids to prepare formulated mixtures which are supplied to end-users.
REACH use descriptors	SU3 (industrial use). PROC 5 (batch mixing/blending). PROC 8b (transfer to/from vessels at dedicated facilities). ERC 2 (formulation of preparations).
<b>3. Operational conditions – task duration and frequency</b>	
Workers in an industrial setting	Up to 8h working day, 150 days/year.
<b>4. Operational conditions – substance usage</b>	
4.1 Substance physical form	Liquid.
4.2 Concentration of substance	Supplied liquid (substance content >90%) used to formulate diluted mixtures (e.g. up to 40% substance content).
4.3 Substance quantity used	Up to 100 tonnes/year at formulation site.
<b>5. Operational conditions – workplace</b>	
Process parameters	Process temperature ca. 20°C (ambient). Non-dispersive use – no aerosol generation. Segregated work area.
<b>6. Risk Management Measures</b>	
6.1 Human health - Personal Protective Equipment	Goggles/glasses with sideshield (e.g. EN166), or full-face respirator. Impermeable gloves (e.g. EN374, nitrile). Protective clothing (e.g. EN368 chemical protection suit). Respiratory protection with vapour/aerosol filter cartridges (e.g. EN405 FFA1 half-face respirator or EN136 full-face respirator).
6.2 Environment – emission controls	Pass site wastewaters to sewage treatment plant with minimum outflow dilution 25-fold at river discharge point; no sludge from this treatment plant to be spread onto agricultural soil (grassland spreading is acceptable).
<b>7. Waste management</b>	
Site waste control measures	Collect emptied containers, spillages and any washings from contaminated areas for safe disposal – avoid release to drains.
<b>8. Exposure estimation</b>	
Exposure assessment method	EASE module within EUSES 2.1.1.
Worker exposure - dermal	Calculated to be negligible. Further limited by use of PPE.
Worker exposure - inhalation	Calculated maximum atmospheric exposure 1.18 mg/cu.m. This is less than 1/10 <sup>th</sup> of the calculated worker long-term inhalation (systemic) DNEL (12.2 mg/cu.m).
Worker exposure - oral	Not relevant – standard industrial hygiene avoids ingestion.
<b>9. Exposure Scenario Boundaries - Downstream User Guidance</b>	
This exposure scenario relates only to the processes and operational conditions specified above. Downstream users should satisfy themselves that their use is compatible with this or another supplied exposure scenario, or make their own chemical safety assessment. In addition to the control and risk management measures specified here and elsewhere in this Safety Data Sheet, product labelling information must be noted. Final responsibility for safe use rests with the end user.	



Oligomerisation products of beta-pinene - Exposure Scenario for Identified Use 2	
<b>1. Scenario title IU2, ES1-8 (covers various sprayer equipment and application rates – see section 5).</b>	
<b>Scenario descriptor</b>	Agricultural/horticultural spray application
<b>2. Processes and activities covered by this exposure scenario</b>	
General description	Professional fieldworkers mixing adjuvant/antitranspirant spray products with water and then spraying crops.
REACH use descriptors	SU22 (professional use). PROC 8a (transfer to/from vessels at non-dedicated facilities). PROC 11 (non-industrial spraying). ERC 8d (wide dispersive outdoor use, processing aids/open systems).
<b>3. Operational conditions – task duration and frequency</b>	
Professionals following appropriate spray application code of practice (open air)	Up to 30 mixing operations/day (tractor-mounted spray tank). Up to 200 mixing operations/day (hand-held spray tank). Up to 6h spraying day; frequent use by spray operators.
<b>4. Operational conditions – substance usage</b>	
4.1 Substance physical form	Liquid.
4.2 Substance concentration	Up to 96 wt% (spray concentrate) mixed with water in spray tank to maximum final spray concentration of 2 wt%
4.3 Substance quantity used	Up to 8976g/ha/year at one field site (see 5 below).
<b>5. Operational conditions – spray application</b>	
Spray application rates	ES1-AR1: 10 l concentrate/8976g substance per ha once/year, tractor broadcast sprayer. ES2-AR1: 10 l concentrate/8976g substance per ha once/year, hand-held atomiser. ES3-AR2: 1 l concentrate/898g substance per ha twice/year, tractor boom sprayer. ES4-AR2: 1 l concentrate/898g substance per ha twice/year, tractor broadcast sprayer. ES5-AR3: 0.3 l concentrate/269g substance per ha 12x/year, tractor boom sprayer. ES6-AR3: 0.3 l concentrate/269g substance per ha 12x/year, tractor broadcast sprayer. ES7-AR4: 5 l concentrate/4488g substance per ha once/year, tractor broadcast sprayer. ES8-AR4: 5 l concentrate/4488g substance per ha once/year, hand-held atomiser.
<b>6. Risk Management Measures</b>	
6.1 Human health - Personal Protective Equipment	Avoid splashing when mixing. Wear impermeable gloves plus protective clothing/coverall for mixing and spraying. Read and follow product label instructions. For IU2-ES2, IU2-ES8 (high-level, hand-held spraying): also wear impermeable protective suit with head covering, eye/face and respiratory protection (e.g. EN368 chemical protection suit, EN166 goggles/glasses with sideshield, EN405 FFA1 half-face respirator with vapour/aerosol filter cartridges or EN136 full-face respirator).
6.2 Environment – emission controls	Apply no-spray buffer zones (distance from nearest watercourse bank): ES1-AR1, ES2-AR1: 100m ES3-AR2, ES4-AR2, ES5-AR3, ES6-AR3: 10m ES7-AR4, ES8-AR4: 40m.
<b>7. Waste management</b>	
Waste control measures	collect container/spray tank washings for re-use, do not release to drains or watercourses
<b>8. Exposure estimation</b>	
Exposure assessment methods	Spray operators: Predicted Operator Exposure Level from UK POEM 7. Re-entry and Bystander exposures – recognised pesticide spray models.
Operator exposure	Maximum POELs during spraying: dermal 2.77 mg/kg/day, inhalation 0.10 mg/kg/day. Maximum re-entry exposure (dermal): 0.12 mg/kg/day. Long-term Derived No-Effect Levels: dermal 3.47 mg/kg/day, inhalation 1.53 mg/kg/day.
Bystander exposure	Maximum exposure (1/day): dermal 1.107 mg/kg/day, inhalation 0.018 mg/kg/day. Long-term Derived No-Effect Levels: dermal 2.08 mg/kg/day, inhalation 1.45 mg/kg/day.
<b>9. Exposure Scenario Boundaries - Downstream User Guidance</b>	



This exposure scenario relates only to the processes and operational conditions specified above. Downstream users should satisfy themselves that their use is compatible with this or another supplied exposure scenario, or make their own chemical safety assessment. Final responsibility for safe use rests with the end user.