## SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

### 1.1 Product identifier

| | |
|---|---|
| **Trade name** | RESOLVE EC347,35 |
| **Product code (UVP)** | 79002149 |

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

| | |
|---|---|
| **Use** | Herbicide |
| **Restrictions on use** | See product label for restrictions. |

### 1.3 Details of the supplier of the safety data sheet

| | |
|---|---|
| **Supplier** | Bayer (Pty) Ltd.<br>27 Wrench Road, P.O. Box 143<br>1600 Isando<br>South Africa |
| **Telephone** | +27 (011) 921 5911 |
| **Telefax** | +27 (011) 921 5766 |
| **Responsible Department** | QHSE - Nigel, South Africa<br>+27 (011) 365 8675 (during business hours only) |

### 1.4 Emergency telephone no.

| | |
|---|---|
| **Emergency telephone no.** | +27 (0861) 555 777 (Western Cape Poisons Helpline) |
| **Global Incident Response Hotline (24h)** | +1 (760) 476 3964 (Company 3E for Bayer AG, Crop Science Division) |

## SECTION 2: HAZARDS IDENTIFICATION

### 2.1 Classification of the substance or mixture

**Classification in accordance with Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures, as amended.**

Carcinogenicity: Category 2
H351 Suspected of causing cancer.

Reproductive toxicity: Category 2
H361d Suspected of damaging the unborn child.

Aspiration hazard: Category 1
H304 May be fatal if swallowed and enters airways.

Eye irritation: Category 2
H315 Causes skin irritation.

Acute aquatic toxicity: Category 1
H400 Very toxic to aquatic life.

Chronic aquatic toxicity: Category 1
H410 Very toxic to aquatic life with long lasting effects.

### 2.2 Label elements

**Labelling in accordance with Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures, as amended.**

Hazard label for supply/use required.

**Hazardous components which must be listed on the label:**

- Pyrasulfotole
- Bromoxynil octanoate
- Bromoxynil heptanoate
- Naphthalene

**Signal word**: Danger

**Hazard statements**

| | |
|---|---|
| H304 | May be fatal if swallowed and enters airways. |
| H319 | Causes serious eye irritation. |
| H351 | Suspected of causing cancer. |
| H361d | Suspected of damaging the unborn child. |
| H410 | Very toxic to aquatic life with long lasting effects. |
| EUH401 | To avoid risks to human health and the environment, comply with the instructions for use. |

**Precautionary statements**

| | |
|---|---|
| P280 | Wear protective gloves/ protective clothing/ eye protection/ face protection. |
| P301 + P310 | IF SWALLOWED: Immediately call a POISON CENTER/doctor/ physician. |
| P331 | Do NOT induce vomiting. |
| P501 | Dispose of contents/container in accordance with local regulation. |

**2.3 Other hazards**

No other hazards known.

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

**3.2 Mixtures**

**Chemical nature**

Emulsifiable concentrate (EC)

**Hazardous components**

Hazard statements according to Regulation (EC) No. 1272/2008

| Name | CAS-No. / EC-No. / REACH Reg. No. | Classification REGULATION (EC) No 1272/2008 | Conc. [%] |
|---|---|---|---|
| Pyrasulfotole | 365400-11-9 | Aquatic Chronic 3, H412 | 3,3 |
| Bromoxynil octanoate | 1689-99-2 | Aquatic Acute 1, H400<br>Skin Sens. 1, H317<br>Aquatic Chronic 1, H410<br>Acute Tox. 4, H302<br>Repr. 2, H361d<br>Acute Tox. 3, H331 | 13,4 |
| Bromoxynil heptanoate | 56634-95-8 | Repr. 2, H361d<br>Acute Tox. 4, H302<br>Acute Tox. 4, H332 | 12,9 |

| | | | |
|---|---|---|---|
| | | Aquatic Acute 1, H400<br>Skin Sens. 1, H317<br>Aquatic Chronic 1, H410 | |
| Mefenpyr-diethyl | 135590-91-9 | Aquatic Chronic 2, H411 | 0,83 |
| 2-Ethylhexanole | 104-76-7 | Acute Tox. 4, H332<br>Skin Irrit. 2, H315<br>Eye Irrit. 2, H319<br>STOT SE 3, H335 | > 1 – < 10 |
| Propylene carbonate | 108-32-7 | Eye Irrit. 2, H319 | > 1 – < 25 |
| Isotridecanol, ethoxylated | 9043-30-5 | Acute Tox. 4, H302<br>Eye Dam. 1, H318 | > 1 – < 10 |
| Solvent Naphtha (petroleum), heavy aromatic | 64742-94-5<br>01-2119451151-53-xxxx | Carc. 2, H351<br>Asp. Tox. 1, H304<br>Aquatic Chronic 2, H411 | > 25 |
| Dodecyl benzene sulphonate, calcium salt | 26264-06-2 | Skin Irrit. 2, H315<br>Eye Dam. 1, H318 | > 1 – < 10 |

**Further information**

| | | |
|---|---|---|
| Bromoxynil octanoate | 1689-99-2 | M-Factor: 10 (acute), 10 (chronic) |

For the full text of the H-Statements mentioned in this Section, see Section 16.

## SECTION 4: FIRST AID MEASURES

### 4.1 Description of first aid measures

**General advice** Move out of dangerous area. Place and transport victim in stable position (lying sideways). Remove contaminated clothing immediately and dispose of safely.

**Inhalation** Move to fresh air. Keep patient warm and at rest. Call a physician or poison control center immediately.

**Skin contact** Wash off thoroughly with plenty of soap and water, if available with polyethyleneglycol 400, subsequently rinse with water. If symptoms persist, call a physician.

**Eye contact** Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Get medical attention if irritation develops and persists.

**Ingestion** Rinse mouth. Do NOT induce vomiting. Call a physician or poison control center immediately.

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

**Symptoms** Aspiration may cause pulmonary oedema and pneumonitis.

### 4.3 Indication of any immediate medical attention and special treatment needed

**Risks** Contains hydrocarbon solvents. May pose an aspiration pneumonia hazard.

| | |
|---|---|
| **Treatment** | Treat symptomatically. In case of ingestion gastric lavage should be considered in cases of significant ingestions only within the first 2 hours. However, the application of activated charcoal and sodium sulphate is always advisable. There is no specific antidote. |

## SECTION 5: FIREFIGHTING MEASURES

**5.1 Extinguishing media**

| | |
|---|---|
| **Suitable** | Water, Alcohol-resistant foam, Dry powder, Carbon dioxide (CO2) |
| **Unsuitable** | None known. |
| **5.2 Special hazards arising from the substance or mixture** | Dangerous gases are evolved in the event of a fire. |

**5.3 Advice for firefighters**

| | |
|---|---|
| **Special protective equipment for firefighters** | In the event of fire, wear self-contained breathing apparatus. |
| **Further information** | Remove product from areas of fire, or otherwise cool containers with water in order to avoid pressure being built up due to heat. Do not allow run-off from fire fighting to enter drains or water courses. |

## SECTION 6: ACCIDENTAL RELEASE MEASURES

**6.1 Personal precautions, protective equipment and emergency procedures**

| | |
|---|---|
| **Precautions** | Use personal protective equipment. Remove all sources of ignition. |
| **6.2 Environmental precautions** | Do not allow to get into surface water, drains and ground water. If the product contaminates rivers and lakes or drains inform respective authorities. |

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

| | |
|---|---|
| **Methods for cleaning up** | Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Collect and transfer the product into a properly labelled and tightly closed container. |
| **6.4 Reference to other sections** | Information regarding safe handling, see section 7.<br>Information regarding personal protective equipment, see section 8.<br>Information regarding waste disposal, see section 13. |

## SECTION 7: HANDLING AND STORAGE

**7.1 Precautions for safe handling**

| | |
|---|---|
| **Advice on safe handling** | Use only in area provided with appropriate exhaust ventilation. |
| **Advice on protection against fire and explosion** | Keep away from heat and sources of ignition. |
| **Hygiene measures** | Remove Personal Protective Equipment (PPE) immediately after handling this product. Remove and wash contaminated gloves, including the inside, before re-use. Remove soiled clothing immediately and clean thoroughly before using again. Wash thoroughly and put on clean |

clothing.

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

| | |
|---|---|
| **Requirements for storage areas and containers** | Store in a cool, dry place and in such a manner as to prevent cross contamination with other crop protection products, fertilizers, food, and feed. Store in original container. Store in a place accessible by authorized persons only. |
| **Suitable materials** | Coex HDPE/EVOH<br>Black mild steel sheet with interior coating |

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

**8.1 Control parameters**

| Components | CAS-No. | Control parameters | Update | Basis |
|---|---|---|---|---|
| Pyrasulfotole | 365400-11-9 | 0,3 mg/m3<br>(TWA) | | OES BCS* |
| Bromoxynil octanoate | 1689-99-2 | 0,21 mg/m3<br>(SK-SEN) | | OES BCS* |
| Mefenpyr-diethyl | 135590-91-9 | 10 mg/m3<br>(TWA) | | OES BCS* |
| Naphthalene | 91-20-3 | 50 mg/m3/10 ppm<br>(TWA) | 1995 | ZA REL |
| Naphthalene | 91-20-3 | 75 mg/m3/15 ppm<br>(STEL) | 1995 | ZA REL |
| Naphthalene | 91-20-3 | 10 ppm<br>(TLV) | | OES BCS* |

*OES BCS: Internal Bayer AG, Crop Science Division "Occupational Exposure Standard"

**8.2 Exposure controls**

| | |
|---|---|
| **Respiratory protection** | Wear respirator with an organic vapours and gas filter mask (protection factor 10) conforming to EN140 type A or equivalent. |
| **Hand protection** | Chemical resistant nitrile rubber gloves |
| **Eye protection** | Wear goggles (conforming to EN166, Field of Use = 5 or equivalent). |
| **Skin and body protection** | Wear standard coveralls and Category 3 Type 3 suit.<br>Wear two layers of clothing wherever possible. Polyester/cotton or cotton overalls should be worn under chemical protection suit and should be professionally laundered frequently. |
| **General protective measures** | Use only in area provided with appropriate exhaust ventilation.<br>Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and warm/tepid water.<br>Keep and wash PPE separately from other laundry. |

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

**9.1 Information on basic physical and chemical properties**

| | |
|---|---|
| **Form** | Liquid, clear |
| **Colour** | beige to brown |
| **Odour** | aromatic, solvent-like |

| | |
|---|---|
| **Odour Threshold** | No data available |
| **pH** | ca. 3,9 at 10 % (23 ℃) (deionized water) |
| **Flash point** | 90 ℃ |
| **Density** | 1,14 g/cm³ at 20 ℃ |
| **Solubility/qualitative** | No data available |
| **Water solubility** | No data available |
| **Partition coefficient: n-octanol/water** | Pyrasulfotole: log Pow: -1,362<br><br>Bromoxynil octanoate: log Pow: 5,4<br>Bromoxynil heptanoate: log Pow: 5,9<br>Mefenpyr-diethyl: log Pow: 3,83 at 21 ℃ |
| **Viscosity, dynamic** | 19,8 mPa.s at 25 ℃ |

## SECTION 10: STABILITY AND REACTIVITY

**10.1 Reactivity**

| | |
|---|---|
| **Thermal decomposition** | Not applicable |
| **10.2 Chemical stability** | Stable under normal conditions. |
| **10.3 Possibility of hazardous reactions** | No hazardous reactions when stored and handled according to prescribed instructions. |

## SECTION 11: TOXICOLOGICAL INFORMATION

**11.1 Information on toxicological effects**

| | |
|---|---|
| **Acute oral toxicity** | LD50 (Rat) > 300 - < 2.000 mg/kg |
| **Acute inhalation toxicity** | LC50 (Rat) > 5 mg/l<br>Exposure time: 4 h<br>Determined in the form of liquid aerosol.<br>Highest attainable concentration. |
| **Acute dermal toxicity** | LD50 (Rat) > 4.000 mg/kg |
| **Skin irritation** | Mild skin irritation. (Rabbit) |
| **Eye irritation** | Moderate eye irritation. (Rabbit) |
| **Sensitisation** | Non-sensitizing. (Guinea pig) |

**Assessment STOT Specific target organ toxicity – single exposure**

Pyrasulfotole: Based on available data, the classification criteria are not met.

Bromoxynil octanoate: Based on available data, the classification criteria are not met.

Mefenpyr-diethyl: Based on available data, the classification criteria are not met.

**Assessment STOT Specific target organ toxicity – repeated exposure**

Pyrasulfotole did not cause specific target organ toxicity in experimental animal studies.
Bromoxynil octanoate caused specific target organ toxicity in experimental animal studies in the following organ(s): Liver. The observed effects do not appear to be relevant for humans.

Bromoxynil heptanoate caused specific target organ toxicity in experimental animal studies in the following organ(s): Liver. The observed effects do not appear to be relevant for humans.
Mefenpyr-diethyl did not cause specific target organ toxicity in experimental animal studies.

**Assessment mutagenicity**

Pyrasulfotole was not genotoxic in a battery of in vitro and in vivo tests.
Bromoxynil octanoate was not mutagenic or genotoxic based on the overall weight of evidence in a battery of in vitro and in vivo tests.
Bromoxynil heptanoate was not mutagenic or genotoxic based on the overall weight of evidence in a battery of in vitro and in vivo tests.
Mefenpyr-diethyl was not mutagenic or genotoxic in a battery of in vitro and in vivo tests.

**Assessment carcinogenicity**

Pyrasulfotole caused at high dose levels an increased incidence of tumours in the following organ(s): Cornea, urinary bladder. The mechanism that triggers tumours in rodents and the type of tumours observed are not relevant to humans.
Bromoxynil octanoate caused at high dose levels an increased incidence of tumours in the following organ(s): Liver. The mechanism of tumour formation is not considered to be relevant to man.
Bromoxynil heptanoate caused at high dose levels an increased incidence of tumours in mice in the following organ(s): Liver. The mechanism of tumour formation is not considered to be relevant to man.
Mefenpyr-diethyl was not carcinogenic in lifetime feeding studies in rats and mice.

**Assessment toxicity to reproduction**

Pyrasulfotole did not cause reproductive toxicity in a two-generation study in rats.
Bromoxynil octanoate did not cause reproductive toxicity in a two-generation study in rats.
Bromoxynil heptanoate did not cause reproductive toxicity in a two-generation study in rats.
Mefenpyr-diethyl did not cause reproductive toxicity in a two-generation study in rats.

**Assessment developmental toxicity**

Pyrasulfotole did not cause developmental toxicity in rats and rabbits.
Bromoxynil octanoate caused a delayed foetal growth, an increased incidence of non-specific malformations. Bromoxynil octanoate caused developmental toxicity only at dose levels toxic to the dams.
Bromoxynil heptanoate caused developmental toxicity only at dose levels toxic to the dams.
Bromoxynil heptanoate caused a delayed foetal growth, an increased incidence of non-specific malformations.
Mefenpyr-diethyl caused developmental toxicity only at dose levels toxic to the dams. The developmental effects seen with Mefenpyr-diethyl are related to maternal toxicity.

**Aspiration hazard**

May be fatal if swallowed and enters airways.

## SECTION 12: ECOLOGICAL INFORMATION

**12.1 Toxicity**

| | |
|---|---|
| **Toxicity to fish** | LC50 (Lepomis macrochirus (Bluegill sunfish)) 0,029 mg/l<br>Exposure time: 96 h<br>The value mentioned relates to the active ingredient bromoxynil octanoate. |
| | LC50 (Lepomis macrochirus (Bluegill sunfish)) 0,029 mg/l<br>Exposure time: 96 h<br>The value mentioned relates to the active ingredient bromoxynil heptanoate. |
| **Toxicity to aquatic invertebrates** | EC50 (Daphnia magna (Water flea)) 0,046 mg/l<br>Exposure time: 48 h |

The value mentioned relates to the active ingredient bromoxynil octanoate.

EC50 (Daphnia magna (Water flea)) 0,031 mg/l
Exposure time: 48 h
The value mentioned relates to the active ingredient bromoxynil heptanoate.

**Toxicity to aquatic plants**

EC50 (Navicula pelliculosa (Freshwater diatom)) 0,043 mg/l
Exposure time: 120 h
The value mentioned relates to the active ingredient bromoxynil octanoate.

EC50 (Lemna gibba (gibbous duckweed)) 0,073 mg/l
The value mentioned relates to the active ingredient bromoxynil octanoate.

**12.2 Persistence and degradability**

**Biodegradability**

Pyrasulfotole:
Not rapidly biodegradable
Bromoxynil octanoate:
Not rapidly biodegradable
Bromoxynil heptanoate:
Not rapidly biodegradable
Mefenpyr-diethyl:
Not rapidly biodegradable

**Koc**

Pyrasulfotole: Koc: 20 - 213
Bromoxynil octanoate: Koc: 639
Bromoxynil heptanoate: Koc: ca. 600
Mefenpyr-diethyl: Koc: 625

**12.3 Bioaccumulative potential**

**Bioaccumulation**

Pyrasulfotole:
Does not bioaccumulate.
Bromoxynil octanoate: Bioconcentration factor (BCF) 230
Does not bioaccumulate.
Bromoxynil heptanoate:
No data available, Does not bioaccumulate.
Mefenpyr-diethyl: Bioconcentration factor (BCF) 232
Does not bioaccumulate.

**12.4 Mobility in soil**

**Mobility in soil**

Pyrasulfotole: Moderately mobile in soils
Bromoxynil octanoate: Slightly mobile in soils
Bromoxynil heptanoate: Slightly mobile in soils
Mefenpyr-diethyl: Slightly mobile in soils

**12.5 Results of PBT and vPvB assessment**

**PBT and vPvB assessment**

Pyrasulfotole: This substance is not considered to be persistent, bioaccumulative and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulative (vPvB).
Bromoxynil octanoate: This substance is not considered to be persistent, bioaccumulative and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulative (vPvB).
Bromoxynil heptanoate: This substance is not considered to be

persistent, bioaccumulative and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulative (vPvB). Mefenpyr-diethyl: This substance is not considered to be persistent, bioaccumulative and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulative (vPvB).

**12.6 Other adverse effects**

## SECTION 13: DISPOSAL CONSIDERATIONS

**13.1 Waste treatment methods**

| | |
|---|---|
| **Product** | Do not dispose of waste into sewer.<br>In accordance with current regulations and, if necessary, after consultation with the site operator and/or with the responsible authority, the product may be taken to a waste disposal site or incineration plant. |
| **Contaminated packaging** | Triple rinse containers.<br>Rinsed packaging may be acceptable for landfill, otherwise incineration will be required in accordance with local regulations.<br>Not completely emptied packagings should be disposed of as hazardous waste. |

## SECTION 14: TRANSPORT INFORMATION

**SANS 10231**

| | |
|---|---|
| 14.1 UN number | **3082** |
| 14.2 Proper shipping name | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.<br>(BROMOXYNIL, PETROLEUM DISTILLATES SOLUTION) |
| 14.3 Transport hazard class(es) | 9 |
| 14.4 Packing group | III |
| 14.5 Environm. Hazardous Mark | YES |

**IMDG**

| | |
|---|---|
| 14.1 UN number | **3082** |
| 14.2 Proper shipping name | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.<br>(BROMOXYNIL, PETROLEUM DISTILLATES SOLUTION) |
| 14.3 Transport hazard class(es) | 9 |
| 14.4 Packing group | III |
| 14.5 Marine pollutant | YES |

**IATA**

| | |
|---|---|
| 14.1 UN number | **3082** |
| 14.2 Proper shipping name | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.<br>(BROMOXYNIL, PETROLEUM DISTILLATES SOLUTION ) |
| 14.3 Transport hazard class(es) | 9 |
| 14.4 Packing group | III |
| 14.5 Environm. Hazardous Mark | YES |

**14.6 Special precautions for user**
See sections 6 to 8 of this Safety Data Sheet.

**14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code**
No transport in bulk according to the IBC Code.

## SECTION 15: REGULATORY INFORMATION

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

## SECTION 16: OTHER INFORMATION

**Text of the hazard statements mentioned in Section 3**

| | |
|---|---|
| H302 | Harmful if swallowed. |
| H304 | May be fatal if swallowed and enters airways. |
| H315 | Causes skin irritation. |
| H317 | May cause an allergic skin reaction. |
| H318 | Causes serious eye damage. |
| H319 | Causes serious eye irritation. |
| H331 | Toxic if inhaled. |
| H332 | Harmful if inhaled. |
| H335 | May cause respiratory irritation. |
| H351 | Suspected of causing cancer. |
| H361d | Suspected of damaging the unborn child. |
| H400 | Very toxic to aquatic life. |
| H410 | Very toxic to aquatic life with long lasting effects. |
| H411 | Toxic to aquatic life with long lasting effects. |
| H412 | Harmful to aquatic life with long lasting effects. |

**Abbreviations and acronyms**

| | |
|---|---|
| ADN | European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways |
| ADR | European Agreement concerning the International Carriage of Dangerous Goods by Road |
| ATE | Acute toxicity estimate |
| CAS-Nr. | Chemical Abstracts Service number |
| Conc. | Concentration |
| EC-No. | European community number |
| ECx | Effective concentration to x % |
| EINECS | European inventory of existing commercial substances |
| ELINCS | European list of notified chemical substances |
| EN | European Standard |
| EU | European Union |
| IATA | International Air Transport Association |
| IBC | International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code) |
| ICx | Inhibition concentration to x % |
| IMDG | International Maritime Dangerous Goods |
| LCx | Lethal concentration to x % |
| LDx | Lethal dose to x % |
| LOEC/LOEL | Lowest observed effect concentration/level |
| MARPOL | MARPOL: International Convention for the prevention of marine pollution from ships |
| N.O.S. | Not otherwise specified |
| NOEC/NOEL | No observed effect concentration/level |
| OECD | Organization for Economic Co-operation and Development |
| RID | Regulations concerning the International Carriage of Dangerous Goods by Rail |

| | |
|---|---|
| TWA | Time weighted average |
| UN | United Nations |
| WHO | World health organisation |

The information contained within this Safety Data Sheet is in accordance with the guidelines established by Regulation (EU) 1907/2006 and Regulation (EU) 2015/830 amending Regulation (EU) No 1907/2006 and any subsequent amendments. This data sheet complements the user's instructions, but does not replace them. The information it contains is based on the knowledge available about the product concerned at the time it was compiled. Users are further reminded of the possible risks of using a product for purposes other than those for which it was intended. The required information complies with current EEC legislation. Addressees are requested to observe any additional national requirements.

Changes since the last version are highlighted in the margin. This version replaces all previous versions.