# Safety Data Sheet

according to the Hazard Communication Standard (CFR29 1910.1200) HazCom 2012

Printing date 12/12/2023 Version: 3.0 Reviewed on 12/12/2023

## 1 Identification

**Product identifier**

**Product name: IRF6 UV-LED Ink, White**

**Article number:** I-6104
**Application of the substance / the mixture:** Printing inks

**Details of the supplier of the safety data sheet**
Direct Color Systems
99 Hammer Mill Rd.
Rocky Hill, CT 06067-USA
**Manufacturer/Supplier:**
Direct Color Systems
99 Hammer Mill Rd.
Rocky Hill, CT 06067-USA
**Emergency telephone number US:** 24/7 CHEMTREC 1-800-424-9300
**Emergency telephone number International:** 24/7 CHEMTREC +1 703-527-3887

## * 2 Hazard(s) identification

**Classification of the substance or mixture**

| | |
|---|---|
| Skin Corrosion 1C | H314 Causes severe skin burns and eye damage. |
| Eye Damage 1 | H318 Causes serious eye damage. |
| Sensitization - Skin 1 | H317 May cause an allergic skin reaction. |
| Toxic to Reproduction 1B | H360 May damage fertility or the unborn child. |
| Specific Target Organ Toxicity - Single Exposure 3 | H336 May cause drowsiness or dizziness. |

**Label elements**
**GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).
**Hazard pictograms**

GHS05 GHS07 GHS08

**Signal word** Danger

**Hazard-determining components of labeling:**
Tetrahydrofurfuryl Acrylate
3,3,5-Trimethylcyclohexyl acrylate
Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide
Dipropylene glycol diacrylate
propylidynetrimethanol, propoxylated, esters with acrylic acid
2-Propenoic acid, 2-(2-ethoxyethoxy)ethyl ester
**Hazard statements**
Causes severe skin burns and eye damage.
May cause an allergic skin reaction.

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May damage fertility or the unborn child.
May cause drowsiness or dizziness.
**Precautionary statements**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dusts or mists.
Wash thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Contaminated work clothing must not be allowed out of the workplace.
Wear protective gloves/protective clothing/eye protection/face protection.
If swallowed: Rinse mouth. Do NOT induce vomiting.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a poison center/doctor.
IF exposed or concerned: Get medical advice/attention.
Specific treatment (see on this label).
If skin irritation or rash occurs: Get medical advice/attention.
Wash contaminated clothing before reuse.
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

## 3 Composition/information on ingredients

**Chemical characterization: Mixtures**
**Description:** Mixture of the substances listed below with nonhazardous additions.

**Dangerous components:**

| | | |
|---|---|---|
| 2399-48-6 | Tetrahydrofurfuryl Acrylate<br>Toxic to Reproduction 1B, H360; Skin Corrosion 1C, H314; Eye Damage 1, H318; Acute Toxicity - Oral 4, H302; Sensitization - Skin 1, H317; Flammable Liquids 4, H227 | 25 - 50% |
| 86178-38-3 | 3,3,5-Trimethylcyclohexyl acrylate<br>Skin Irritation 2, H315; Eye Irritation 2A, H319; Sensitization - Skin 1B, H317; Specific Target Organ Toxicity - Single Exposure 3, H336 | 25 - 50% |
| 53879-54-2 | propylidynetrimethanol, propoxylated, esters with acrylic acid<br>Eye Irritation 2A, H319; Sensitization - Skin 1, H317 | 10 - 25% |
| 7329-17-8 | 2-Propenoic acid, 2-(2-ethoxyethoxy)ethyl ester<br>Acute Toxicity - Dermal 4, H312; Skin Irritation 2, H315; Sensitization - Skin 1A, H317; Eye Irritation 2B, H320 | 10 - 25% |
| 75980-60-8 | Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide<br>Toxic to Reproduction 2, H361 | 2.5 - 10% |
| 13463-67-7 | titanium dioxide<br>Carcinogenicity 2, H351 | ≥ 2.5 - ≤ 10% |
| 57472-68-1 | Dipropylene glycol diacrylate<br>Eye Damage 1, H318; Skin Irritation 2, H315; Sensitization - Skin 1, H317 | ≥ 0 - ≤ 10% |
| | Ethanol, 2-amino-, polymer with α-hydro-ω-[(1-oxo-2-propen-1-yl)oxy]poly(oxy-1,2-ethanediyl) ether with 2-ethyl-2-(hydroxymethyl)-1,3-propanediol (3:1)<br>Skin Irritation 2, H315; Eye Irritation 2A, H319 | ≤ 2.5% |

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## 4 First-aid measures

**Description of first aid measures**

**General information:**

Immediately remove any clothing soiled by the product.

Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.

**After inhalation:**

Supply fresh air and to be sure call for a doctor.

In case of unconsciousness place patient stably in side position for transportation.

**After skin contact:** Immediately wash with water and soap and rinse thoroughly.

**After eye contact:** Rinse opened eye for several minutes under running water. Then consult a doctor.

**After swallowing:**

Immediately call a doctor.

Drink copious amounts of water and provide fresh air. Immediately call a doctor.

**Most important symptoms and effects, both acute and delayed** No further relevant information available.

**Indication of any immediate medical attention and special treatment needed**

No further relevant information available.

## 5 Fire-fighting measures

**Extinguishing media**

**Suitable extinguishing agents:** Use fire fighting measures that suit the environment.

**Special hazards arising from the substance or mixture** No further relevant information available.

**Advice for firefighters**

**Protective equipment:** No special measures required.

## 6 Accidental release measures

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

Wear protective equipment. Keep unprotected persons away.

**Environmental precautions:**

Do not allow product to reach sewage system or any water course.

Inform respective authorities in case of seepage into water course or sewage system.

Dilute with plenty of water.

Do not allow to enter sewers/ surface or ground water.

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

Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Use neutralizing agent.

Dispose contaminated material as waste according to section 13.

Ensure adequate ventilation.

**Reference to other sections**

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.

See Section 13 for disposal information.

## 7 Handling and storage

**Handling:**

**Precautions for safe handling**

Ensure good ventilation/exhaustion at the workplace.

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Open and handle receptacle with care.
Prevent formation of aerosols.
**Information about protection against explosions and fires:** Keep respiratory protective device available.

**Conditions for safe storage, including any incompatibilities**
**Storage:**
**Requirements to be met by storerooms and receptacles:** No special requirements.
**Information about storage in one common storage facility:** Not required.
**Further information about storage conditions:** Keep receptacle tightly sealed.
**Specific end use(s)** No further relevant information available.

## 8 Exposure controls/personal protection

**Additional information about design of technical systems:** No further data; see section 7.

**Control parameters**
**Components with limit values that require monitoring at the workplace:**
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
**Additional information:** The lists that were valid during the creation were used as basis.

**Exposure controls**
**Personal protective equipment:**
**General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.
**Breathing equipment:**
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.
**Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
**Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
**Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

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**Product name: IRF6 UV-LED Ink, White**

**Eye protection:**

Tightly sealed goggles

## 9 Physical and chemical properties

**Information on basic physical and chemical properties**

**General Information**

**Appearance:**

**Form:** Liquid

**Color:** White

**Odor:** Characteristic

**Odor threshold:** Not determined.

**pH-value:** Not determined.

**Change in condition**

**Melting point/Melting range:** Undetermined.

**Boiling point/Boiling range:** Undetermined.

**Flash point:** Not applicable.

**Flammability (solid, gaseous):** Not applicable.

**Decomposition temperature:** Not determined.

**Ignition temperature:** Product is not selfigniting.

**Danger of explosion:** Product does not present an explosion hazard.

**Explosion limits:**

**Lower:** Not determined.

**Upper:** Not determined.

**Vapor pressure:** Not determined.

**Density:** Not determined.

**Relative density** Not determined.

**Vapor density** Not determined.

**Evaporation rate** Not determined.

**Solubility in / Miscibility with**

**Water:** Fully miscible.

**Partition coefficient (n-octanol/water):** Not determined.

**Viscosity:**

**Dynamic:** Not determined.

**Kinematic:** Not determined.

**Other information** No further relevant information available.

## 10 Stability and reactivity

**Reactivity** No further relevant information available.

**Chemical stability**

**Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.

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**Product name: IRF6 UV-LED Ink, White**

**Possibility of hazardous reactions** No dangerous reactions known.
**Conditions to avoid** No further relevant information available.
**Incompatible materials:** No further relevant information available.
**Hazardous decomposition products:** No dangerous decomposition products known.

## * 11 Toxicological information

**Information on toxicological effects**

**Acute toxicity:**

**LD/LC50 values that are relevant for classification:**

**ATE (Acute Toxicity Estimate)**

Oral LD50 3,268 mg/kg (rat)

Dermal LD50 9,821 mg/kg

**2399-48-6 Tetrahydrofurfuryl Acrylate**

Oral LD50 928 mg/kg (rat)

**53879-54-2 propylidynetrimethanol, propoxylated, esters with acrylic acid**

Oral LD50 > 2,000 mg/kg (rat)

**7329-17-8 2-Propenoic acid, 2-(2-ethoxyethoxy)ethyl ester**

Dermal LD50 1,100 mg/kg (ATE)

**13463-67-7 titanium dioxide**

Oral LD50 > 20,000 mg/kg (rat)

Dermal LD50 > 10,000 mg/kg (rabbit)

Inhalative LC50/4 h > 6.82 mg/l (rat)

**Primary irritant effect:**

**on the skin:** Strong caustic effect on skin and mucous membranes.

**on the eye:** Strong caustic effect.

**Sensitization:** Sensitization possible through skin contact.

**Additional toxicological information:**

The product shows the following dangers according to internally approved calculation methods for preparations:
Harmful
Corrosive
Irritant
Swallowing will lead to a strong caustic effect on mouth and throat and to the danger of perforation of esophagus and stomach.

**Carcinogenic categories**

**IARC (International Agency for Research on Cancer)**

13463-67-7 titanium dioxide: 2B

15625-89-5 2,2-bis(acryloyloxymethyl)butyl acrylate: 2B

108-88-3 Toluene: 3

79-10-7 acrylic acid: 3

128-37-0 Butylated hydroxytoluene: 3

**NTP (National Toxicology Program)**

None of the ingredients is listed.

**OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients is listed.

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**Product name: IRF6 UV-LED Ink, White**

## 12 Ecological information

**Toxicity**
**Aquatic toxicity:** No further relevant information available.
**Persistence and degradability** No further relevant information available.
**Behavior in environmental systems:**
**Bioaccumulative potential** No further relevant information available.
**Mobility in soil** No further relevant information available.
**Ecotoxical effects:**
**Remark:** Very toxic for fish
**Additional ecological information:**
**General notes:**
Water hazard class 3 (Self-assessment): extremely hazardous for water
Do not allow product to reach ground water, water course or sewage system, even in small quantities.
Must not reach bodies of water or drainage ditch undiluted or unneutralized.
Danger to drinking water if even extremely small quantities leak into the ground.
Also poisonous for fish and plankton in water bodies.
Very toxic for aquatic organisms
**Results of PBT and vPvB assessment**
**PBT:** Not applicable.
**vPvB:** Not applicable.
**Other adverse effects** No further relevant information available.

## 13 Disposal considerations

**Waste treatment methods**
**Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

**Uncleaned packagings:**
**Recommendation:** Disposal must be made according to official regulations.
**Recommended cleansing agent:** Water, if necessary with cleansing agents.

## 14 Transport information

| | |
|---|---|
| **UN-Number** | |
| **DOT** | not regulated |
| **IMDG, IATA** | UN3082 |
| **UN proper shipping name** | |
| **DOT** | not regulated |
| **IMDG** | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Tetrahydrofurfuryl Acrylate, 3,3,5-Trimethylcyclohexyl acrylate), MARINE POLLUTANT |
| **IATA** | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Tetrahydrofurfuryl Acrylate, 3,3,5-Trimethylcyclohexyl acrylate) |

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**Product name: IRF6 UV-LED Ink, White**

**Transport hazard class(es)**

**DOT**

**Class** not regulated

**IMDG, IATA**

**Class** 9 Miscellaneous dangerous substances and articles

**Label** 9

**Packing group**

**DOT** not regulated

**IMDG, IATA** III

**Environmental hazards:**

**Marine pollutant:** Symbol (fish and tree)

**Special marking (IATA):** Symbol (fish and tree)

**Special precautions for user** Warning: Miscellaneous dangerous substances and articles

**Hazard identification number (Kemler code):** 90

**EMS Number:** F-A,S-F

**Stowage Category** A

**Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code** Not applicable.

**Transport/Additional information:**

**IMDG**

**Limited quantities (LQ)** 5L

**Excepted quantities (EQ)** Code: E1
Maximum net quantity per inner packaging: 30 ml
Maximum net quantity per outer packaging: 1000 ml

**UN "Model Regulation":** UN 3082 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (TETRAHYDROFURFURYL ACRYLATE, 3,3,5-TRIMETHYLCYCLOHEXYL ACRYLATE), 9, III

## * 15 Regulatory information

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

No further relevant information available.

**SARA**

**Section 355 (extremely hazardous substances):**

None of the ingredients is listed.

**Section 313 (Specific toxic chemical listings):**

None of the ingredients is listed.

**TSCA (Toxic Substances Control Act):**

86178-38-3 3,3,5-Trimethylcyclohexyl acrylate: ACTIVE

53879-54-2 propylidynetrimethanol, propoxylated, esters with acrylic acid: ACTIVE

75980-60-8 Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide: ACTIVE

13463-67-7 titanium dioxide: ACTIVE

57472-68-1 Dipropylene glycol diacrylate: ACTIVE

**Hazardous Air Pollutants**

108-88-3 Toluene

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**Product name: IRF6 UV-LED Ink, White**

79-10-7 acrylic acid

**Proposition 65**

**Chemicals known to cause cancer:**

13463-67-7 titanium dioxide

15625-89-5 2,2-bis(acryloyloxymethyl)butyl acrylate

**Chemicals known to cause reproductive toxicity for females:**

None of the ingredients is listed.

**Chemicals known to cause reproductive toxicity for males:**

None of the ingredients is listed.

**Chemicals known to cause developmental toxicity:**

108-88-3 Toluene

**Carcinogenic categories**

**EPA (Environmental Protection Agency)**

110-82-7 cyclohexane: I

108-88-3 Toluene: II

**TLV (Threshold Limit Value)**

13463-67-7 titanium dioxide: A4

108-88-3 Toluene: A4

79-10-7 acrylic acid: A4

128-37-0 Butylated hydroxytoluene: A4

**NIOSH-Ca (National Institute for Occupational Safety and Health)**

13463-67-7 titanium dioxide

**GHS label elements** The product is classified and labeled according to the Globally Harmonized System (GHS).

**Hazard pictograms**

GHS05 GHS07 GHS08

**Signal word** Danger

**Hazard-determining components of labeling:**
Tetrahydrofurfuryl Acrylate
3,3,5-Trimethylcyclohexyl acrylate
Diphenyl(2,4,6-trimethylbenzoyl)phosphine oxide
Dipropylene glycol diacrylate
propylidynetrimethanol, propoxylated, esters with acrylic acid
2-Propenoic acid, 2-(2-ethoxyethoxy)ethyl ester

**Hazard statements**
Causes severe skin burns and eye damage.
May cause an allergic skin reaction.
May damage fertility or the unborn child.
May cause drowsiness or dizziness.

**Precautionary statements**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dusts or mists.
Wash thoroughly after handling.
Use only outdoors or in a well-ventilated area.

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Contaminated work clothing must not be allowed out of the workplace.
Wear protective gloves/protective clothing/eye protection/face protection.
If swallowed: Rinse mouth. Do NOT induce vomiting.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a poison center/doctor.
IF exposed or concerned: Get medical advice/attention.
Specific treatment (see on this label).
If skin irritation or rash occurs: Get medical advice/attention.
Wash contaminated clothing before reuse.
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.

**Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

## 16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

**Relevant phrases**
H227 Combustible liquid.
H302 Harmful if swallowed.
H312 Harmful in contact with skin.
H314 Causes severe skin burns and eye damage.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H319 Causes serious eye irritation.
H320 Causes eye irritation.
H336 May cause drowsiness or dizziness.
H351 Suspected of causing cancer.
H360 May damage fertility or the unborn child.
H361 Suspected of damaging fertility or the unborn child.

**Contact:**

**Date of preparation / last revision** 12/12/2023

**Abbreviations and acronyms:**
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Flammable Liquids 4: Flammable liquids – Category 4
Acute Toxicity - Oral 4: Acute toxicity – Category 4
Skin Corrosion 1C: Skin corrosion/irritation – Category 1C
Skin Irritation 2: Skin corrosion/irritation – Category 2

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Eye Damage 1: Serious eye damage/eye irritation – Category 1
Eye Irritation 2A: Serious eye damage/eye irritation – Category 2A
Eye Irritation 2B: Serious eye damage/eye irritation – Category 2B
Sensitization - Skin 1: Skin sensitisation – Category 1
Sensitization - Skin 1A: Skin sensitisation – Category 1A
Sensitization - Skin 1B: Skin sensitisation – Category 1B
Carcinogenicity 2: Carcinogenicity – Category 2
Toxic to Reproduction 1B: Reproductive toxicity – Category 1B
Toxic to Reproduction 2: Reproductive toxicity – Category 2
Specific Target Organ Toxicity - Single Exposure 3: Specific target organ toxicity (single exposure) – Category 3

*** Data compared to the previous version altered.**