Material Safety Data Sheet

Section 1 - Product and Company Identification

Product name：RGB Rework (SF-R03)
Other names：RGB Rework chemical
Product use：Removing color on the color filter (Semiconductor、TFT-LCD Photolithography process)
Supplier's name：San Fu Chemical Co., Ltd., Shan Hua Plant
Supplier's address：340 Hsiao Hsin Li, Shan Hua, Tainan Hsien, Taiwan, R.O.C.
Supplier's phone：06-5837608 Emergency phone：06-5837608
FAX.：06-5839498

Section 2 - Hazards Identification

Classification：

1. Acute Toxicity Category I (Skin)
2. Corrosive to Metals Category I
3. Skin Corrosion/Irritation Category I
4. Serious Eye Damage/Eye Irritation Category I

The Most Important Hazards and effect

Label element：Exclamation Mark, Corrosive

- Hazard symbol：
- Signal word：Danger

Hazard statement：

1. Cause eye irritation
2. May be corrosive to metals
3. Cause sever skin burns and eye damage

Precautionary statement：

1. If contact with eyes, flush with plenty of water. Get medical attention immediately.
2. Remove contaminated clothes immediately.
3. Wear appropriate protective gear, including clothing, gloves, chemical safety goggles and/or a full face shield.

Others Hazard：--

Section 3 - Composition/Information On Ingredients

Mixture：

Component or impurities contributing to the hazard	Concentration or concentration range（%）	CAS No.
Potassium hydroxide	< 20%	1310-58-3
Alkanolamine	< 20%	
Glycol ether solvent	< 20%	--
Alcohol	< 10%	--

Surfactant	< 5%	--
Water	< 50%	7732-18-5

Section 4 - First Aid Measures

The First-aid Information：

- Inhalation：
  1. Move to fresh air.
  2. Get medical attention immediately.
- Skin Contact：
  1. Immediately flush contaminated areas with water for at least 20 minutes.
  2. Get medical attention immediately.
- Eye Contact：
  1. Immediately flush eyes with water for at least 20 minutes.
  2. Get medical attention immediately.
- Ingestion：
  1. If the patient is conscious, drink about 240~300 ml water.
  2. If swallowed, don't induce vomiting.
  3. Get medical attention immediately.
  4. Neutralization is not suggested.

The Most Important Symptoms and Hazardous Effects： Irritation to the respiratory tract, skin, eyes

Protection of First-aiders：

1. Wear goggles, anticorrosive gloves, protective clothing
2. Avoid breathing vapor

Notes to a Physician：Strong base chemicals, cause burns, pain

Section 5 - Fire Fighting Measures

Extinguishing Media：

1. Alcohol foam, chemical powder, or water spray.
2. When fight with large fire, use foam or water spray.

Specific Hazards when Fire-fight：

1. Medium fire hazard when exposed to heat or flame.
2. Vapor is heavier than air and may travel along the floor to a source of ignition and flash back.
3. Vapor/air mixtures are explosive.
4. Vapor is explosive in air at temperatures higher than the flash point.

Specific Fire-fighting Procedure：

1. Move container from fire area if it can be done without risk.
2. Cool containers with water spray until the fire is out.
3. Stay away from the ends of tanks.
4. For massive fire in cargo area, use unmanned holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn.
5. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.
6. Let tank, tank car, or tank truck burn unless leak can be stopped; with smaller tanks or

cylinders, extinguish/isolate from other flammables.
7. Isolate for ½ mile in all directions if tank, rail car, or tank truck is involved in fire.
8. Extinguish only if flow can be stopped.
9. Use water in flooding amounts as fog.
10. Apply water from a protected location from a safe distance.
11. Avoid inhalation of material or combustion by-products.
12. Stay upwind and keep out of low areas.

Specific Protection of Firefighters：
As in any fire, wear a self-contained breathing apparatus in pressure demand, MSHA/NIOSH (approved or equivalent), anti-dust and anti-splash goggles, protective gloves.

Section 6 - Accidental Release Measures

Personal Precautions：
1. Isolate and restrict area access until clean up.
2. Ensure clean up is conducted by trained personnel only.
3. Must wear proper personal protection equipment.

Environmental Precautions： Well-ventilated the contaminated area.

Methods for Cleaning up：
1. Avoid contact with spills.
2. Prevent from entering sewers or confined space.
3. If safe to do so, stop or reduce spills.
4. Absorb or dike spill with sand or other inert, stable, and non-flammable materials.
5. Small amounts of residue may be flushed with plenty of water.
6. Large spills: contact the fire department, emergency management agency, or the suppliers immediately.

Section 7 - Handling and Storage

Handling：
1. The staff should receive proper training and inform the risk and safety handling method.
2. Empty tanks, containers, and pipes may have hazardous residue. Never weld, cut, or drill before clean-up.
3. The inert gas could be placed in the container to reduce the possibility of the fire or the explosion.
4. Exit routes should be kept in unblocked.
5. Avoid producing vapor and mist, operating in well-ventilated area only. Handling amount of usage should be kept to a minimum. Separate the working area and storage place.
6. Wear appropriate personal protective equipments if necessary to avoid contact with the polluted chemicals.
7. Do not pour unused portion back into container - it may contaminate product.
8. Label the container, and keep the container closed while not in use.

Storage：
1. Store in a cool, dry, well-ventilated area away from sunshine, heat source, and incompatible substances.
2. Consider install equipment to prevent spilling.
3. Store in a cool fireproof location.
4. Install Well-ventilated system. Keep away from sources of spark, open flame, oxidizing

agents. Use explosion-proof equipment and certified safety electric equipments. Use proof electrical equipment (ventilating, lighting and handling).

5. The flooring where the product is stored should be impermeable to the product.
6. Make a threshold at the door and build a slope or a groove in front of the door to enable the fluid leakage to be emitted to a safe place.
7. Clearly labeled in the entrance of the storage place, no obstacle. Only allowed trained personnel access.
8. Separate the working area and storage place. Away from the elevator and main entrance of the building/room.
9. Keep a fire extinguisher and cleaning equipment nearby.
10. All equipments should be regularly checked and maintained.
11. All containers should be regularly checked and maintained for the label and damage.
12. Control the storage in a limited amount.
13. Store in the suggested temperature. (avoid higher than 50℃) If necessary, install the temperature alarm.
14. Avoid the indoor storage in large amount. Ensure the storage in an isolated fireproof building.
15. The storing basin shall be based on the ground with its base completely sealed from leakage, and shall be surrounded by a fluid-protective dike capable of carrying the entire volume of storage.

Section 8 - Exposure Controls & Personal Protection

Ventilation and engineering Controls：

Whenever possible, the use of local exhaust ventilation or other engineering controls is the preferred method of controlling exposure to airborne particulate. Where utilized, exhaust inlets to the ventilation system must be positioned as close as possible to the source of airborne generation. Avoid disruption of the airflow in the area of a local exhaust inlet by equipment such as a man-cooling fan. Check ventilation equipment regularly to ensure it is functioning properly. Provide training on the use and operation of ventilation to all users. Use qualified professionals to design and install ventilation systems.

Control parameters			
TWA	STEL	Ceiling	Biological standards
2mg/m^3	--	--	--

Personal protective equipment：

- Respiratory Protection:
  1. If repeated overexposure, appropriate personal respiratory protective equipment is highly recommended.
  2. Different equipments are required when exposure in different concentration.
  3. Confirm the warning notice before using.
  4. Unknown concentration or under condition of endanger to healthy and life: Wear any NIOSH approved full-face piece self-contained breathing apparatus and positive pressure demand.
- Hand Protection：Wear chemical impervious gloves.
- Eye Protection：Safety glasses should be worn whenever working with chemicals. Goggles or a face shield are required if there is a chance of splashing. Emergency shower and eyewash facility nearby.
- Skin and Body Protection：Wear appropriate protective clothing and boots to prevent skin contact. Emergency shower and eyewash should be nearby.

Hygiene measures： 1. Remove contaminated clothes immediately; clean thoroughly before reuse or disposal. Must inform the danger to the laundry worker. 2. Smoking, eating and drinking are prohibited in work area. 3. Wash hands thoroughly after handing this substance. 4. Maintain a clean working environment.

Section 9 - Physical & Chemical Properties

Physical state：liquid (Liquid under normal temp.)	Odor：Ammonia odor.
Colour：colorless or light yellow transparent	Melting Point: --
Flammability: --	Boiling point/boiling range：> 100℃
pH value：> 13	Flash point：> 65℃
Decomposition temp.：--	Test method：closed
Autoignition temp.：> 131℃	Explosion properties：--
Vapor pressure：< 100 mmHg	Vapor density：< 1.0
Density：1.2 ± 0.1	Solubility：miscible in water
log Kow：-1.31	Evaporation Rate：< 1

Section 10 - Stability & Reactivity Data

Stability：Stable under normal temperature and pressure
Possible hazardous reactions under specific conditions：--
Conditions to avoid：--
Materials to avoid：Strong oxidizer, acid, peroxide
Hazardous decomposition products：May decomposing carbon oxides (CO, CO_2).

Section 11 - Toxicological Information

Route of exposure：skin, inhalation, eye, ingestion
Symptoms：coughing, asphyxia, burns with mucous membrane, low blood pressure, weak, quick pulse, pneumonia, pain in chest, difficulty in breathing, cyanosis, dizziness, burn in skin and eyes.
Immediate Toxicity： ■ Inhalation: 1. May cause respiratory irritation syndrome, include coughing, choking, pain in nose/mouse, sore throat, and possibly burns of the mucous membranes. 2. In some cases, pulmonary edema may develop, either immediately in severe cases or more often with a latent period of 5-72 hours. The symptoms may include tightness in the chest, dyspnea, frothy sputum, cyanosis, and dizziness. 3. Physical findings may include hypotension, breathing difficulty, and rapid pulse. ■ Skin: 1. Direct contact may cause severe pain, burns and possibly brownish stains. 2. The corroded areas may be soft, gelatinous, and necrotic. Tissue destruction may be deep. ■ Eye:

1. Direct contact may cause pain and burns. The injury condition depends on the concentration and the period of the contact.
2. There may be edema, destruction of epithelium, corneal opacification and iritis.
3. When severe burns, the full extent of the injury may not be immediately apparent. Late complications may include persistent edema, vascularization and scarring of the cornea, permanent opacity, staphyloma, cataract, and symblepharon.

■ Ingestion:

1. Ingestion of strong alkali may be followed by severe pain, vomiting, diarrhea, & collapse.
2. If death does not occur in the first 24 hours, the patient may improve for 2-4 days and then have a sudden onset of severe abdominal pain, boardlike abdominal rigidity, and rapid fall of blood pressure indicating delayed gastric or esophageal perforation.
3. Damage to esophagus and stomach after ingestion may progress for 2-3 weeks.
4. Death from peritonitis may occur as late as 1 month after ingestion.
5. Even though the patient recovers from the immediate damage, esophageal stricture may occur in weeks, months, or even years later to make swallowing difficult.
6. Esophageal stricture can occur weeks, months, or even years later to make swallowing difficult. Carcinoma is a risk in later life.

- LD_{50}: --
- LC_{50}: --

Specific effects：

1. Effects are dependent upon concentration and duration of exposrue. Repeated or prolonged exposure may cuase inflammation/ulceration of mouth and bronchus, Gastrointestinal barrier, dermatitis, conjunctivitis, or similar effects to those for actue exposure.
2. Subjected to 3-6% NaOH aqueous solution on the skin of mice for 46 weeks, coal tars will form and then develop into tumors.

Section 12 - Ecological Information

Ecotoxicology：

- L_{C50}(fish)：165000 μg/L@24 hour(s)（Poecilia reticulata）
- E_{C50}(Aquatic Invertebrates)：--
- Bioconcentration factor (BCF)：--

Persistence and degradability：

- Half-Life (Air)：--
- Half-Life (Water surface)：--
- Half-Life (Groundwater)：--
- Half-Life (Soil)：--

Bioaccumulative potential：--

Mobility in soil：--

Other adverse effects：--

Section 13 - Disposal Considerations

Methods of disposal：

Dispose of as special waste in compliance with local and national environmental laws and

regulations.

Section 14 - MSDS Transport Information

UN classification number：--
Proper D.O.T Shipping Name：--
Hazard Class：8
Packing Group：--
Marine pollution：n/a
Specific precautionary transport measures and conditions：According to the local environmental protection regulation, should examine the standard transferring equipment and certification.

Section 15 - Regulatory Information

Regulations：

1. Regulations for Labor Safety and Health Installations
2. Regulations for Chemical Hazard Communication
3. Permissible Exposure Limits of Hazardous Substances in the Work Environment
4. Road Traffic Safety Regulations
5. Industrial Waste Storage and Disposal Regulations and Facility Standards

Section 16 - Other Information

Literature references	1. RTECS Data Bank, TOMES PLUS, Vol. 68, 2006 2. ChemWatch Data Bank, 2006-1 3. OHS MSDS Data Bank, 2006 4. HSDB Data Bank, TOMES CPS (CD) Vol. 68，2006		
Prepared by	Suppler：San Fu Chemical Co., Ltd. Shan Hua Plant		
	Address：340 Hsiao Hsin Li, Shan Hua, Tainan Hsien, Taiwan, R.O.C.		
	TEL：06-5837608 FAX：06-5839498		
	Name：Chunfel Chang		
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