Junqing Xie SVT Associates 10/7/04

DATE PREPARED: August. 2, 2001

PRODUCT NAME: **JSR NFR105G**

MATERIAL SAFETY DATA SHEET

1.CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Identifier:	**JSR NFR105G**
General Use:	Photoresist for Integrated Circuit Production
Product Description:	Photosensitizer and Phenolic resin solution

MANUFACTURER:
JSR Corporation
2-11-24, Tsukiji,
Chuo-ku, Tokyo
Japan 104-8410

DISTRIBUTOR
JSR Microelectronics Inc.
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CHEMTREC : 800-424-9300
(in USA) 24Hrs Every day
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24Hrs Every day

2.COMPOSITION / INFORMATION ON INGREDIENTS

	%	CAS #
Phenolic resin	5-30	Proprietary
Trisphenol derivative	1- 5	Proprietary
Glycoluryl compound	1-10	Proprietary
Sulfonium salt compound	0.1- 5	Proprietary
Ethyl lactate(EL)	40-60	97- 64 - 3
Ethyl 3-ethoxypropionate(EEP)	15-30	763- 69 - 9

3.HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Clear, pale yellow viscous liquid with a sweet ester-like odor.

POTENTIAL HEALTH EFFECTS

INHALATION:

Inhalation may cause anesthesia.

EYE CONTACT:

Eye contact may cause irritation, possibly severe.

SKIN CONTACT:

Prolonged and repeated contact with skin may cause irritation.

INGESTION:

Swallowing may nauseate and cause pain in esophagus and stomach.

CARCINOGENICITY:

Not known to be carcinogenic.

NTP? No IARC MONOGRAPHS? No OSHA Regulated? No

NFPA RATINGS (SCALE 0 – 4): HEALTH=2 FIRE=2 REACTIVITY=0

4.FIRST AID MEASURES

INHALATION:

Remove exposed person to fresh air, perform artificial respiration if necessary.

EYE CONTACT:

Immediately flush eyes with plenty of water at least 15 min. Call a physician.

SKIN CONTACT:

Flush skin with water.

INGESTION:

Give large quantities of water and induce vomiting; contact a poison center and have MSDS information available.

5.FIRE-FIGHTING MEASURES

GENERAL HAZARD:

Combustible Liquid. May release vapors that form flammable mixtures when temperatures are at or above the flash point. Toxic gases will form upon combustion.

EXTINGUISHING MEDIA:

Carbon dioxide, alcohol foam or dry chemical.

SPECIAL FIRE FIGHTING PROCEDURES:

Water should be used to keep fire exposed containers cool and to dispense vapors. Firefighters should wear self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

None.

HAZARDOUS COMBUSTION PRODUCTS:

Smoke, fumes and oxides of carbon.

6. ACCIDENTAL RELEASE MEASURES

GENERAL:

Provide maximum ventilation.

LAND SPILL:

Dike or absorb with inert absorbent material such as sand or saw-dust and transfer to container for disposal.

WATER SPILL:

Remove from surface by skimming or with suitable absorbents.

7.HANDLING AND STORAGE

GENERAL:

Store in original container in a dry area. Avoid heat, sunlight, ignition sources. Open only under safe light and well ventilated conditions. Loosen closure cautiously before opening. When using this substance: (a) avoid breathing the substance; (b) avoid ingestion;(c) use respiratory protection when in dust or mist form. Wear chemical goggles, resistant gloves and protective clothing to prevent contact. Wash thoroughly after handling.

STORAGE TEMPERATURE:	Between 32 and 50° F (0 - 10° C)
STORAGE PRESSURE:	Atmospheric

8.EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

The use of local exhaust ventilation is recommended to control emissions near the source. Laboratory samples should be handled in a fumehood. Provide mechanical ventilation of confined spaces. Use explosion-proof ventilation equipment.

PERSONAL PROTECTION:

GENERAL:

The use an air supplied respirator is recommended.

OSHA HAZARDS	Exposure Limits 8 hrs. TWA(ppm)	
(29 CFR 1910.1200)	OSHA PEL	ACGIH TLV
Phenolic resin	Not-established	Not-established
Trisphenol derivative	Not-established	Not-established
Glycoluryl compound	Not-established	Not-established
Sulfonium salt compound	Not-established	Not-established
EL	Not-established	Not-established
EEP	Not-established	Not-established

9. PHYSICAL AND CHEMICAL PROPERTIES

Vapor Pressure:	2.7mmHg	
Specific gravity:	1.03	
Solubility in water:	Moderate	
Boiling Point:	154° C	
Flashpoint and Method:	55° C(estimated from similar grade)	
Flammable Limits:	LFL; 1.1 %	UFL; 11.4%
Autoignition Temperature:	377° C	

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10. STABILITY AND REACTIVITY

INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:

Strong oxidizing agents.

HAZARDOUS DECOMPOSITION:

This material is stable under recommended storage and handling conditions.

HAZARDOUS POLYMERIZATION:

May not occur.

11. TOXICOLOGICAL INFORMATION

SOLVENT (EL)

ACUTE TOXICITY

Oral	LD50	rat	5,000 mg/kg
Oral	LD50	mouse	2,500 mg/kg

SOLVENT (EEP)

ACUTE TOXICITY

Oral	LD50	male rat	>5,000mg/kg
	LD50	female rat	4,300mg/kg
Dermal	LD50	guinea pig	>20 ml/kg
Inhalation	LC50	rat	1,000ppm/6H
Skin irritation		guinea pig	slight
Eye irritation		rabbit	slight

DEVELOPMENTAL TOXICITY

Pregnant rats and rabbits were exposed to vapor concentration of 0, 125, 500, 1000 ppm, 6H/day, on gestational days 6-15(rats) or 6-18(rabbits). No teratogenic effects were observed.

Phenolic resin: No information available

Glycoluryl compound:

ACUTE TOXICITY

Oral	LD50	rat	> 7,000mg/kg

Sulfonium salt compound: No information available

12. ECOLOGICAL INFORMATION

Biodegradation

SOLVENT:

EL; No information available

EEP

FISH TOXICITY LC50 fathead minnow 65ul/l(96H)

BIODEGRADATION A 21-day biodegradation test showed 34.8% degradation.

COD 1.92 g O2/g

BOD5 0.37 g O2/ml at 10ul/l

Phenolic resin: No information available

Glycoluryl compound: No information available

Sulfonium salt compound: No information available

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13. DISPOSAL CONSIDERATION

The user of this product must properly characterize the waste generated from the use of this product in accordance with all applicable federal, state and/or local laws and regulations in order to determine the proper disposal of the waste in accordance with all applicable federal, state and/or local laws and regulations.

14. TRANSPORT INFORMATION

U. S. DOT PROPER SHIPPING NAME:	Resin solution, 3, UN1866, III
IATA PROPER SHIPPING NAME:	Resin solution
IDENTIFICATION NUMBER:	UN 1866

15. REGULATORY INFORMATION

OSHA HAZARD COMMUNICATION STANDARD, 29 CFR 1910.1200: Ensure that the hazards associated with this product are transmitted to employees by means of a hazard communications program, in accordance with federal and state Occupational Safety and Health Administration (OSHA) regulations.

CERCLA/SUPERFUND HAZARD CATEGORY: At the time of this document's preparation, none of the ingredients of this product were listed in 40 CFR 302.4. The list should be periodically checked for applicable updates.

SARA 313 INFORMATION: At the time of this document's preparation, none of the ingredients of this product were listed in 40 CFR 372. The list should be periodically checked for applicable updates.

TOXIC SUBSTANCES CONTROL ACT (TSCA): All of the compounds in this product are on the TSCA Inventory and/or are subject to a Low Volume Exemption. The Trisphenol derivative is subject to the significant new use rule(40 CFR 721.5867). In accordance with federal regulations, this Photoresist shall be used only to industrially manufacture integrated circuits. In particular, this material shall not be distributed to any person, other than for disposal, until after it has been completely reacted on integrated circuits or similar media. All users must utilize the worker protection measures and environmental release controls specified in this Material Safety Data Sheet.

The significant new use rule codified in 40 CFR 721.5867 should be reviewed to ensure hazard communication programs, workplace practices, pollution prevention and record-keeping meet federal requirements. One specific new use designated for "Substituted phenol" involves a "Release to Water" that would result in a concentration in the receiving water of 1 part par billion or greater [40 CFR 721. 5867(2)(i)]. The reference method for calculating the concentration of the pollutant in water is codified in 40 CFR 721.90(a)(4),(b)(4)(where n=1). The significant new use rule applies to all manufactures, processors and users. Use of this product without implementing the programs specified in 40 CFR 721.5867 shall be considered a significant new use.

Acknowledgment of receipt of this Material Safety Data Sheet shall be considered acknowledgment that the user will comply with these requirements.

CALIFORNIA PROPOSITION 65: At the time of this document's preparation, none of the ingredients of this product were included on the California Proposition 65 list of chemicals known to cause cancer or reproductive toxicity. The list should periodically be checked for applicable updates.

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16. OTHER INFORMATION

REVISION SUMMARY

Feb. 16, 1999	Original MSDS established.
Jan. 6, 2000	Revision 1 established.
Aug. 2, 2001	Revision 2 established.

To the best of our knowledge, the information contained herein is accurate. However, neither JSR Corporation nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution.

Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist.