DOW CORNING

DOW CORNING CORPORATION
Material Safety Data Sheet

DOW CORNING(R) WL-5351 PHOTOPATTERNABLE SPIN-ON SILICONE

1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

MSDS No.: 04036517

SUPPLIER:
Dow Corning Canada Inc.
15-6400 Millcreek Drive, Suite 416
Mississauga, ON, Canada L5N 3E7

Prepared by Product Safety: (800) 248-2481
NEWALTA: (800) 567-7455
Revision Date: 2007/05/15

MANUFACTURER:
Dow Corning Corporation
South Saginaw Road
Midland, Michigan 48686

24 Hour Emergency Telephone: (989) 496-5900

WHMIS CLASSIFICATION: **Class B, Division 3.**
Class B, Division 6.
Class D, Division 2, Subdivision A.
Class D, Division 2, Subdivision B.

Material Usage: **Electronics/Microelectronics application, Semiconductor coating**

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Generic Description: **Silicone resin solution.**
Physical Form: **Liquid**
Colour: **Colorless**
Odour: **Solvent odor.**

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POTENTIAL HEALTH EFFECTS

Acute Effects

Eye: Direct contact may cause moderate irritation.

Skin: No significant irritation expected from a single short-term exposure.

Inhalation: Overexposure by inhalation may cause drowsiness, dizziness, confusion or loss of coordination.

Oral: Low ingestion hazard in normal use.

Prolonged/Repeated Exposure Effects

Skin: Repeated or prolonged contact may cause defatting and drying of skin which may result in skin irritation and dermatitis.

Inhalation**:** Overexposure by inhalation may injure the following organ(s): Blood.

Oral: No known applicable information.

Signs and Symptoms of Overexposure

No known applicable information.

Medical Conditions Aggravated by Exposure

No known applicable information.

The above listed potential effects of overexposure are based on actual data, results of studies performed upon similar compositions, component data and/or expert review of the product. Please refer to Section 11 for the detailed toxicology information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

CAS Number	Wt %	Component Name
108-67-8	15.0 - 40.0	1,3,5-Trimethylbenzene
68037-59-2	15.0 - 40.0	Dimethyl, methylhydrogen siloxane
3555-47-3	1.0 - 5.0	Tetra(trimethylsiloxy) silane
None	0.5 - 1.5	Dimethyl, methylhydrogen cyclosiloxane
1330-20-7	0.5 - 1.5	Xylene
556-67-2	0.5 - 1.5	Octamethylcyclotetrasiloxane
100-41-4	0.1 - 1.0	Ethylbenzene
68037-53-6	0.1 - 1.0	Methylhydrogen cyclosiloxanes
95-63-6	0.1 - 1.0	1,2,4-Trimethylbenzene

The ingredients listed above are controlled products as defined in CPR, am. SOR/88-555.

4. FIRST AID MEASURES

Eye: Immediately flush with water for 15 minutes. Get medical attention.

Skin: Remove from skin and wash thoroughly with soap and water or waterless cleanser. Get medical attention if irritation or other ill effects develop or persist.

Inhalation:	Remove to fresh air. Get medical attention if ill effects persist.
Oral:	No first aid should be needed.
Notes to Physician:	Treat according to person's condition and specifics of exposure.

5. FIRE FIGHTING MEASURES

Flash Point:	111.2 °F / 44 °C (Closed Cup)
Autoignition Temperature:	Not available.
Flammability Limits in Air:	Not available.
Extinguishing Media:	On large fires use dry chemical, foam or water spray. On small fires use carbon dioxide (CO2), dry chemical or water spray. Water can be used to cool fire exposed containers.
Fire Fighting Measures:	Self-contained breathing apparatus and protective clothing should be worn in fighting large fires involving chemicals. Determine the need to evacuate or isolate the area according to your local emergency plan. Use water spray to keep fire exposed containers cool.
Unusual Fire Hazards:	Static electricity will accumulate and may ignite vapors. Prevent a possible fire hazard by bonding and grounding or inert gas purge.

6. ACCIDENTAL RELEASE MEASURES

Containment/Clean up:	Remove possible ignition sources. Determine whether to evacuate or isolate the area according to your local emergency plan. Observe all personal protection equipment recommendations described in Sections 5 and 8. For large spills, provide diking or other appropriate containment to keep material from spreading. If diked material can be pumped, store recovered material in appropriate container. Materials in contact with water, moisture, acids or bases have the potential to generate hydrogen gas. Recovered material should be stored in a vented container. Clean up remaining materials from spill with suitable absorbant. Clean area as appropriate since spilled materials, even in small quantities, may present a slip hazard. Final cleaning may require use of steam, solvents or detergents. Dispose of saturated absorbant or cleaning materials appropriately, since spontaneous heating may occur. Local, provincial, federal laws and regulations may apply to releases and disposal of this material, as well as those materials and items employed in the cleanup of releases.

Note: See section 8 for Personal Protective Equipment for Spills. Call (989) 496-5900, if additional information is required.

7. HANDLING AND STORAGE

Use with adequate ventilation. Traces of benzene (carcinogen) may form if heated in air above 300°F (149°C). Provide ventilation to control vapor exposure within inhalation guidelines when handling at elevated temperatures. Avoid eye contact. Avoid skin contact. Avoid breathing vapor, mist, dust, or fumes. Keep container closed.

Static electricity will accumulate and may ignite vapors. Prevent a possible fire hazard by bonding and grounding or inert gas purge. Keep container closed and away from heat, sparks, and flame. Product evolves minute quantities of flammable hydrogen gas which can accumulate. Adequately ventilate to maintain vapors well below flammability limits and exposure guidelines. Do not repackage. Do not store in glass containers which may shatter due to pressure build up. Clogged container vents may increase pressure build up. Keep container closed and store away from water or moisture.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

Consult local authorities for acceptable provincial values.

CAS Number	Component Name	Exposure Limits
108-67-8	1,3,5-Trimethylbenzene	None established. LC50: 2400 mg/m3 - Inhalation Rat ; 4 Hrs
1330-20-7	Xylene	Observe xylene limits. OSHA PEL (final rule) and ACGIH TLV: TWA 100 ppm, STEL 150 ppm. LC50: 5000 ppm - Inhalation Rat; 4 Hrs LD50: 4,300 mg/kg - Oral Rat LD50: > 1,700 mg/kg - Dermal Rabbit
556-67-2	Octamethylcyclotetrasiloxane	Dow Corning guide: TWA 10 ppm. LC50: 36 mg/L - Inhalation Rat ; 4 Hrs LD50: > 2,000 mg/kg - Oral Rat
100-41-4	Ethylbenzene	OSHA PEL (final rule): TWA 100 ppm, 435 mg/m3. ACGIH TLV: TWA 100 ppm, STEL 125 ppm. LD50: 3,500 mg/kg - Oral Rat
95-63-6	1,2,4-Trimethylbenzene	None established. LC50: 1800 mg/m3 - Inhalation Rat ; 4 Hrs LD50: 5,000 mg/kg - Oral Rat

Engineering Controls

Local Ventilation: Recommended.
General Ventilation: Recommended.

Personal Protective Equipment for Routine Handling

Eyes: Use proper protection - safety glasses as a minimum.

Skin:	Wash at mealtime and end of shift. Contaminated clothing and shoes should be removed as soon as practical and thoroughly cleaned before reuse. Chemical protective gloves are recommended.
Suitable Gloves:	Teflon(R). Polyvinylalcohol. Silver Shield(R). Viton(R). 4H(R).
Inhalation:	Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines. IH personnel can assist in judging the adequacy of existing engineering controls.
Suitable Respirator:	General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits as determined by air sampling or are unknown, appropriate respiratory protection should be worn. Follow CSA Standard Z94.4-93 and use NIOSH/MHSA approved respirators.

Personal Protective Equipment for Spills

Eyes:	Use full face respirator.
Skin:	Wash at mealtime and end of shift. Contaminated clothing and shoes should be removed as soon as practical and thoroughly cleaned before reuse. Chemical protective gloves are recommended.
Inhalation/Suitable Respirator:	Respiratory protection recommended. Follow CSA Standard Z94.4-93 and use NIOSH/MHSA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.
Precautionary Measures:	Avoid eye contact. Avoid skin contact. Avoid breathing vapor, mist, dust, or fumes. Keep container closed. Use reasonable care.
Comments:	Traces of benzene (carcinogen) may form if heated in air above 300°F (149°C). Provide ventilation to control vapor exposure within inhalation guidelines when handling at elevated temperatures.

Note: These precautions are for room temperature handling. Use at elevated temperature or aerosol/spray applications may require added precautions. For further information regarding aerosol inhalation toxicity, please refer to the guidance document regarding the use of silicone-based materials in aerosol applications that has been developed by the silicone industry (www.SEHSC.com) or contact the Dow Corning customer service group.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Form:	Liquid
Color:	Colorless
Odor:	Solvent odor.
Odor Threshold:	Not available.
Specific Gravity @ 25°C:	1.01
Viscosity:	650 mPa s

Freezing/Melting Point:	Not available.
Boiling Point:	> 136 °C
Vapor Pressure @ 25°C:	Not available.
Vapor Density:	Not available.
Evaporation Rate:	Not available.
Solubility in Water:	Not available.
Coefficient of Water/Oil Distribution:	Not available.
pH:	Not available.
Volatile Content:	Not available.
Flash Point:	111.2 °F / 44 °C (Closed Cup)
Autoignition Temperature:	Not available.
Flammability Limits in Air:	Not available.

Note: The above information is not intended for use in preparing product specifications. Contact Dow Corning before writing specifications.

10. STABILITY AND REACTIVITY

Chemical Stability:	Stable.
Hazardous Polymerization:	Hazardous polymerization will not occur.
Conditions to Avoid:	None.
Materials to Avoid:	Oxidizing material can cause a reaction. Water, alcohols, acidic or basic materials, and many metals or metallic compounds, when in contact with product, liberate flammable hydrogen gas, which can form explosive mixtures in air.

Hazardous Decomposition Products

Thermal breakdown of this product during fire or very high heat conditions may evolve the following decomposition products: Carbon oxides and traces of incompletely burned carbon compounds. Silicon dioxide. Formaldehyde. Hydrogen.

11. TOXICOLOGICAL INFORMATION

Component Toxicology Information

Repeated inhalation or oral exposure of mice and rats to octamethylcyclotetrasiloxane and decamethylcyclopentasiloxane produced an increase in liver size. No gross histopathological or significant clinical chemistry effects were observed. An increase in liver metabolizing enzymes, as well as a transient increase in the number of normal cells (hyperplasia) followed by an increase in cell size (hypertrophy) were determined to be the underlying causes of the liver enlargement. The biochemical mechanisms producing these effects are highly sensitive in rodents, while similar mechanisms in humans are insensitive. Good industrial hygiene practice minimizes inhalation exposure to any chemical. Dow Corning has set an exposure guideline of 10 ppm TWA for these two materials.

In developmental toxicity studies in which rats and rabbits were exposed to octamethylcyclotetrasiloxane by vapor inhalation at concentrations up to 700 ppm and 500 ppm respectively, no teratogenic effects were observed.

Octamethylcyclotetrasiloxane administered to rats by whole body inhalation at concentrations of 500 and 700 ppm for 70 days prior to mating, through mating, gestation and lactation resulted in decreases in live litter size. Additionally, increases in the incidence of deliveries of offspring extending over an unusually long time period (dystocia) were observed at these concentrations. Statistically significant alterations in these parameters were not observed in the lower concentrations evaluated (300 and 70 ppm). In a previous range-finding study, rats exposed to vapor concentrations of 700 ppm had decreases in the number of implantation sites and live litter size. The significance of these findings to humans is not known.

A 2 yr combined chronic/carcinogenicity assay was conducted on octamethylcyclotetrasiloxane (D4). Fischer-344 rats were exposed by whole-body vapor inhalation 6 hrs/day, 5 days/week for up to 104 weeks to 0,10, 30,150 or 700 ppm of D4. A statistically significant increase in incidence of (uterine) endometrial cell hyperplasia and uterine adenomas (benign tumors) was observed in female rats at 700 ppm. Since these effects only occurred at 700 ppm, a level that greatly exceeds typical workplace or consumer exposure, it is unlikely that industrial, commercial or consumer uses of products containing OMCTS/D4 would result in a significant risk to humans.

Special Hazard Information on Components

Carcinogens

CAS Number	Wt %	Component Name	
100-41-4	0.1 - 1.0	Ethylbenzene	IARC Group 2B - Possibly Carcinogenic to Humans.

Teratogens

CAS Number	Wt %	Component Name	
1330-20-7	0.5 - 1.5	Xylene	Evidence of teratogenicity (birth defects) in laboratory animals.
100-41-4	0.1 - 1.0	Ethylbenzene	Evidence of teratogenicity (birth defects) in laboratory animals.

Reproductive Effects

CAS Number	Wt %	Component Name	
556-67-2	0.5 - 1.5	Octamethylcyclotetrasiloxane	Evidence of reproductive effects in laboratory animals.

12. ECOLOGICAL INFORMATION

Environmental Fate and Distribution

Complete information is not yet available.

Environmental Effects

Complete information is not yet available.

Fate and Effects in Waste Water Treatment Plants

Complete information is not yet available.

Ecotoxicity Classification Criteria

Hazard Parameters (LC50 or EC50)	High	Medium	Low
Acute Aquatic Toxicity (mg/L)	<=1	>1 and <=100	>100
Acute Terrestrial Toxicity	<=100	>100 and <= 2000	>2000

This table is adapted from "Environmental Toxicology and Risk Assessment", ASTM STP 1179, p.34, 1993.

This table can be used to classify the ecotoxicity of this product when ecotoxicity data is listed above. Please read the other information presented in the section concerning the overall ecological safety of this material.

13. DISPOSAL CONSIDERATIONS

Can be incinerated in accordance with local regulations.

Call local hazardous waste disposal company or provincial waste authorities for more information.

14. TRANSPORT INFORMATION

Canada Road (Based on IMDG Regulations)

Proper Shipping Name: FLAMMABLE LIQUID, N.O.S.

Hazard Technical Name: 1,3,5-Trimethylbenzene / Polymethylhydrogensiloxane

Hazard Class: 3

UN/NA Number: UN 1993

Packing Group: III

Hazard Label(s): flammable liquid

Ocean Shipment (IMDG)

Proper Shipping Name: FLAMMABLE LIQUID, N.O.S.

Hazard Technical Name: 1,3,5-Trimethylbenzene / Polymethylhydrogensiloxane

Hazard Class:	3
UN/NA Number:	UN 1993
Packing Group:	III
Hazard Label(s):	flammable liquid

Air Shipment (IATA)

Proper Shipping Name:	Flammable liquid, n.o.s.
Hazard Technical Name:	1,3,5-Trimethylbenzene / Polymethylhydrogensiloxane
Hazard Class:	3
UN/NA Number:	UN 1993
Packing Group:	III
Hazard Class:	Flammable Liquid
Remarks:	VENTED PACKAGES ARE FORBIDDEN FOR AIR TRANSPORT.

Call Dow Corning Transportation, (989) 496-8577, if additional information is required.

15. REGULATORY INFORMATION

This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

WHMIS CLASSIFICATION:	Class B, Division 3. Class B, Division 6. Class D, Division 2, Subdivision A. Class D, Division 2, Subdivision B.
DSL STATUS:	Consult your local Dow Corning office.

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16. OTHER INFORMATION

Prepared by: Dow Corning Corporation

These data are offered in good faith as typical values and not as product specifications. No warranty, either expressed or implied, is hereby made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate.

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