SAFETY DATA SHEET

SECTION 1 - IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Amyris, Inc.	**EU contact:**	**Emergency telephone**
5885 Hollis Street, Ste. 100	**HH Compliance Ltd.**	**number (Chemtrec):**
Emeryville, CA 94608	**Unit 14 D Nutgrove Office Park**	1-(800) 424-9300 (US and
Main: +1 (510) 450-0761	**Nutgrove Ave, Rathfarnham**	Canada)
Fax: +1 (510) 225-2645	**Dublin 14, Ireland**	1-(703) 527-3887 (Collect
E-mail: SDS@amyris.com	**Tel: +353 (1) 2157999**	calls accepted)

Product identifier Squalane

Synonyms Tetracosane, 2,6,10,15,23-hexamethyl-Dodecahydrosqualene; Perhydrosqualene; Cosbiol, Robane, Spinacane, Vitabiosol, Renewable Squalane

Trade names Neossance™ Squalane

Chemical family Paraffinic hydrocarbons

REACH Registration No.: 01-2120014832-65-0004

Relevant identified uses of the substance or mixture and uses advised against Used as a natural emollient, lubricant, and humectant in cosmetics.

Note This SDS is written to address the handling of this chemical during manufacturing under industrial use conditions. If further information becomes available, this SDS will be updated.

Issue Date 28 February 2014

SECTION 2 - HAZARDS IDENTIFICATION

Classification of the substance or mixture

Regulation (EC) 1272/2008 [GHS] Not classified as hazardous under these regulations.

Directive 67/548/EEC or 1999/45/EC Not classified as hazardous under these regulations.

Label elements

CLP/GHS hazard pictogram None required

CLP/GHS signal word None required

SECTION 2 - HAZARDS IDENTIFICATION …continued

CLP/GHS hazard statements None required

CLP/GHS precautionary statements None required.

Other hazards No information identified for squalane.

NFPA Classification: Health Hazard: 1; Fire Hazard: 1; Reactivity Hazard; 0

Note This substance is not considered hazardous according to Directive 67/548/EEC, Regulation (EC) No 1272/2008 (EU CLP) and applicable US regulations. The GHS classifications are based on Regulation (EC) 1272/2008.

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	CAS #	EINECS/ELINCS#	Amount	EU Classification	GHS Classification
Squalane	111-01-3	203-825-6	92-94%	Not classified	Not classified
Isosqualane	NA	NA	3.5-4.5%	Not classified	Not classified
C30 Hydrocarbons	NA	NA	0.6-2.1%	Not classified	Not classified

Note The substance listed above is not considered hazardous under EU and US criteria. The EU classification is based on Directive 67/548/EEC and the GHS classification is based on Regulation (EC) 1272/2008.

SECTION 4 - FIRST AID MEASURES

Description of first aid measures

Immediate Medical Attention Needed No. If exposed or concerned: Get medical advice/attention.

Eye Contact If easy to do, remove contact lenses, if worn. Immediately flush eyes with copious quantities of water for at least 15 minutes. If irritation occurs or persists, notify medical personnel and supervisor.

Skin Contact Wash exposed area with soap and water and remove contaminated clothing/shoes. If irritation occurs or persists, notify medical personnel and supervisor.

Inhalation Immediately move exposed subject to fresh air. If not breathing, give artificial respiration. If breathing is labored, administer oxygen. Immediately notify medical personnel and supervisor.

SECTION 4 - FIRST AID MEASURES …continued

Ingestion	If swallowed, call a physician immediately. Do not induce vomiting unless directed by medical personnel. Do not give anything to drink unless directed by medical personnel. Never give anything by mouth to an unconscious person. Notify medical personnel and supervisor.
Protection of first aid responders	See Section 8 for Exposure Controls/Personal Protection recommendations.
Most important symptoms and effects, both acute and delayed	See Sections 2 and 11
Indication of immediate medical attention and special treatment needed, if necessary	Treat symptomatically and supportively. If accidental exposure occurs to an individual who is also taking one or more concomitant medications, consult the respective package or prescribing information for potential drug interactions.

SECTION 5 - FIREFIGHTING MEASURES

Extinguishing media	Use water spray (fog), foam, dry powder, or carbon dioxide, as appropriate for surrounding fire and materials.
Specific hazards arising from the substance or mixture	No information identified. May emit toxic fumes of carbon monoxide and carbon dioxide.
Flammability/Explosivity	No explosivity or flammability data identified. High airborne concentrations of finely divided organic particles can potentially explode if ignited.
Advice for firefighters	Wear full protective clothing and a self-contained breathing apparatus with a full facepiece operated in the pressure demand or other positive pressure mode. Decontaminate all equipment after use.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	If product is released or spilled, take proper precautions to minimize exposure by using appropriate personal protective equipment (see Section 8). Area should be adequately ventilated.
Environmental precautions	Do not empty into drains. Avoid release to the environment.
Methods and material for containment and cleaning up	For small spills (such as in a laboratory), soak up material with absorbent, e.g., damp paper towel, and wash spill area thoroughly with soap and water. For large spills in manufacturing, use an industrial vacuum cleaner equipped with a high efficiency particulate (HEPA) filter if available. Alternatively if in solid or dried form, do not raise dust. Surround spill or powder with absorbents and place a damp cloth or towel over the area to minimize powder from entering the air. Add excess liquid to allow for the material to enter solution. Capture remaining liquid

SECTION 6 - ACCIDENTAL RELEASE MEASURES …continued

Methods and material for containment and cleaning up …continued

onto spill absorbents. Place spill materials into a leak-proof container suitable for disposal. Decontaminate area a second time. Dispose of material in a manner that is compliant with federal, state and local laws.

Reference to other sections

See Sections 8 and 13 for more information.

SECTION 7 - HANDLING AND STORAGE

Precautions for safe handling

Avoid contact with eyes, skin and other mucous membranes. Wash thoroughly after handling. Use personal protective equipment. Avoid breathing vapor. Do not eat, drink or smoke while handling this product. Avoid prolonged or repeated exposure. Provide sufficient air exchange and/or exhaust in workrooms. Use normal preventative fire protection measures. Keep away from sources of ignition. Keep away from incompatible materials such as oxidizing agents.

Conditions for safe storage including any incompatibilities

Keep container tightly closed in a cool and well ventilated area. To maintain product quality, do not store in heat or direct sunlight.

Specific end use(s)

No information identified.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters/Occupational Exposure Limit Values

Compound	Issuer	Type	OEL
Squalane	--	--	--

DNEL/PNEC Limits

In the chemical safety assessment performed according to Article 14 in connection with Annex 1(Health, environmental and PBT/vPvB assessments), no hazard was identified. Therefore according to REACH, an exposure estimation is not necessary. Consequently all identified uses of the substance are assessed as safe for human health and environment.

Exposure/Engineering controls

Selection and use of containment devices and personal protective equipment should be based on a risk assessment of exposure potential. Use of local exhaust and/or enclosures at mist/ aerosol/spray-generating points is recommended. High-energy operations such as spraying should be done within an approved emission control or containment system.

Respiratory protection

Choice of respiratory protection should be appropriate to the task and the level of existing engineering controls. An approved and properly fitted air-purifying respirator with HEPA filters should provide ancillary protection based on the known or foreseeable limitations of existing engineering controls.

Hand protection

Wear nitrile or other impervious gloves if skin contact is possible as squalane may act as a vehicle for skin absorption of other toxic substances in the workplace.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION …continued

Skin protection	Wear protective overgarment if skin contact is likely. Base the choice of skin protection on the job activity, potential for skin contact and solvents and reagents in use.
Eye/face protection	Wear safety glasses with side shields, chemical splash goggles, or full face shield, if necessary. Base the choice of protection on the job activity and potential for contact with eyes or face. An emergency eye wash station should be available.
Environmental Exposure Controls	Avoid release to the environment and operate within closed systems wherever practicable. Air and liquid emissions should be directed to appropriate pollution control devices. In case of spill, do not release to drains. Implement appropriate and effective emergency response procedures to prevent release or spread of contamination and to prevent inadvertent contact by personnel.
Other protective measures	Wash hands after handling substance especially before eating, drinking or smoking. Protective equipment is not to be worn outside the work area (e.g., in common areas or out-of-doors). Decontaminate all protective equipment following use.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Liquid
Color	Clear to Colorless
Odor	No information identified.
Odor threshold	No information identified.
pH	No information identified.
Melting point/freezing point	-38°C (-36.4°F)
Initial boiling point and boiling range	176°C (348°F) at 0.05 mm Hg; 210-215°C at 1.0 mm Hg
Flash point	218 °C (424 °F)
Evaporation rate	No information identified.
Flammability (solid, gas)	No information identified.
Upper/lower flammability or explosive limits	No information identified.
Vapor pressure	No information identified
Vapor density	No information identified.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES …continued

Relative density	0.81 g/mL
Water solubility	Insoluble.
Solvent solubility	Soluble in alcohols.
Partition coefficient (*n-octanol/water*)	No information identified.
Auto-ignition temperature	No information identified.
Decomposition temperature	No information identified.
Viscosity	34 cP at 20°C.
Explosive properties	Non explosive.
Oxidizing properties	No information identified.

Other information

Molecular weight	422.83
Molecular formula	$C_{30}H_{62}$

SECTION 10 - STABILITY AND REACTIVITY

Reactivity	No information identified.
Chemical stability	Stable under recommended storage conditions.
Possibility of hazardous reactions	Not expected to occur.
Conditions to avoid	Keep away from heat, sparks, and open flame.
Incompatible materials	Strong oxidizing agents.
Hazardous decomposition products	No information identified.

SECTION 11 - TOXICOLOGICAL INFORMATION

Information on toxicological effects

Route of entry	May be absorbed by inhalation, skin contact and ingestion.
Acute toxicity	Squalane is not considered acutely toxic. No adverse effects were noted in repeat dose studies on rats (Wistar) at dose rates >1000 mg/kg bw for up to 28 days.

SECTION 11 - TOXICOLOGICAL INFORMATION …continued

Irritation/Corrosion	Squalane is considered non-irritating based on results from both skin and eye irritation testing carried out according to EPA OPPTS 870.2500 and 870.2400, respectively.
Sensitization	Squalane is not a dermal sensitizer based on results from Local Lymph Node Assay and Human Repeat Insult Patch Test with 100% squalane which showed no adverse effects.
STOT-single exposure	No studies identified.
STOT-repeated exposure/Repeat-dose toxicity	Squalane is not considered toxic from repeated exposure.
Reproductive toxicity	No adverse effect observed; NOEAL 1000 mg/kg bw/day (chronic; rat).
Developmental toxicity	No adverse effect observed; NOEAL 1000 mg/kg bw/day (chronic; rat).
Genotoxicity	Negative in an Ames bacterial cell mutagenicity assay.
Carcinogenicity	No studies identified. This substance is not listed by NTP, IARC, ACGIH or OSHA as a carcinogen.
Aspiration hazard	No
Human health data	See "Section 2 - Other Hazards"
Additional information	None available.

SECTION 12 - ECOLOGICAL INFORMATION

Toxicity

Compound	Type	Species	Concentration
Squalane	LC50 (96h)	*Danio rerio*	>100 mg/L
	NOEC (72h)	*Pseudokirchnerella subcapitata*	>100 mg/L
	LC50 (48h)	*Daphnia magna*	>100 mg/L

Additional toxicity information	No data available for the minor components.
Persistence and Degradability	Squalane is considered inherently biodegradable.
Bioaccumulative potential	No data available.
Mobility in soil	No data available.
Results of PBT and vPvB assessment	Based on the results of the chemical safety assessment, squalane is not a PBT/vPvB substance. It is inherently biodegradable and not toxic to aquatic species.
Other adverse effects	No data available.
Note	The environmental characteristics of this substance have not been fully investigated. Releases to the environment should be avoided.

SECTION 13 - DISPOSAL CONSIDERATIONS

Waste treatment methods	Used product should be disposed of according to local, state, and federal regulations. Do not send down the drain or flush down the toilet. All wastes containing the material should be properly labeled. Dispose of wastes in accordance to prescribed federal, state, and local guidelines, e.g., appropriately permitted chemical waste incinerator. Rinse waters resulting from spill cleanups should be discharged in an environmentally safe manner, e.g., appropriately permitted municipal or on-site wastewater treatment facility.

SECTION 14 - TRANSPORT INFORMATION

Transport	Based on the available data, this substance is not regulated as a hazardous material/ dangerous good under EU ADR/RID, US DOT, Canada TDG, IATA, or IMDG.
UN number	None assigned.
UN proper shipping name	None assigned.
Transport hazard classes and packing group	None assigned.
Environmental hazards	Based on the available data, this substance is not regulated as an environmental hazard or a marine pollutant.
Special precautions for users	Avoid release to the environment.
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.

SECTION 15 - REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture	This SDS complies with the requirements under US, EU and GHS (EU CLP - Regulation EC No 1272/2008) guidelines.
Chemical safety assessment	Not conducted.
OSHA Hazardous	Not hazardous.
WHMIS classification	This substance does not meet any of the hazard criteria of the Controlled Products Regulations and the SDS contains all of the information required by those regulations.
TSCA status	Listed on the TSCA inventory.

SECTION 15 - REGULATORY INFORMATION …continued

SARA section 313	Not listed.
California proposition 65	Not listed.

SECTION 16 - OTHER INFORMATION

Full text of R phrases and EU Classifications	Not applicable.
Full text of H phrases, P phrases and GHS classification	Not applicable.
Sources of data	Information from published literature and internal company data.
Abbreviations	ACGIH - American Conference of Governmental Industrial Hygienists ADR/RID - European Agreement Concerning the International Carriage of Dangerous Goods by Road/Rail AIHA - American Industrial Hygiene Association CAS# - Chemical Abstract Services Number DNEL - Derived No Effect Level DOT - Department of Transportation EINECS - European Inventory of New and Existing Chemical Substances ELINCS - European List of Notified Chemical Substances EU - European Union GHS - Globally Harmonized System of Classification and Labelling of Chemicals IARC - International Agency for Research on Cancer IDLH - Immediately Dangerous to Life or Health IATA - International Air Transport Association IMDG - International Maritime Dangerous Goods LOEL - Lowest Observed Effect Level LOAEL - Lowest Observed Adverse Effect Level NIOSH - The National Institute for Occupational Safety and Health NOEL - No Observed Effect Level NOAEL - No Observed Adverse Effect Level NTP - National Toxicology Program OEL - Occupational Exposure Limit OSHA - Occupational Safety and Health Administration PBT - Persistent, Bioaccumulative and Toxic PNEC - Predicted No Effect Concentration SARA - Superfund Amendments and Reauthorization Act STEL - Short Term Exposure Limit TDG - Transport Dangerous Goods TSCA - Toxic Substances Control Act TWA - Time Weighted Average WHMIS - Workplace Hazardous Materials Information System
Revisions	This is the eighth version of this SDS.

SECTION 16 - OTHER INFORMATION …continued

Disclaimer

The above information is based on data available to us and is believed to be correct. Since the information may be applied under conditions beyond our control and with which we may be unfamiliar, we do not assume any responsibility for the results of its use and all persons receiving it must make their own determination of the effects, properties and protections which pertain to their particular conditions. No representation, warranty, or guarantee, express or implied (including a warranty of fitness or merchantability for a particular purpose), is made with respect to the materials, the accuracy of this information, the results to be obtained from the use thereof, or the hazards connected with the use of the material. Caution should be used in the handling and use of the material because it is a pharmaceutical product. The above information is offered in good faith and with the belief that it is accurate. As of the date of issuance, we are providing all information relevant to the foreseeable handling of the material. However, in the event of an adverse incident associated with this product, this Safety Data Sheet is not, and is not intended to be, a substitute for consultation with appropriately trained personnel.