

SAFETY DATA SHEET

1. Identification

Product identifier: Dynasylan® 1189

Chemical name: N-[3-(trimethoxysilyl)propyl]butylamine

Other means of identification

Recommended use: For industrial use
Coupling agent
Crosslinking agents
Surface modifier
Polymer modification

Recommended restrictions: Not determined.

Manufacturer/Importer/Distributor Information

Company Name : Evonik Operations GmbH
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45128 Essen
Germany

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Emergency

2. Hazard(s) identification

Classification according to GHS

Health Hazards

Skin Corrosion/Irritation	Category 2
Serious Eye Damage/Eye Irritation	Category 1

Label Elements

Hazard Symbol:



Signal Word: Danger

Hazard Statement: Causes skin irritation.
Causes serious eye damage.

Precautionary Statements

Prevention: Wash face, hands and any exposed skin thoroughly after handling. Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response: IF ON SKIN: Wash with plenty of water. 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 or doctor/physician. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.

Other hazards: No data available.

3. Composition/information on ingredients

Chemical name:
N-[3-(trimethoxysilyl)propyl]butylamine

Substances

Chemical Identity	Common name and synonyms	CAS number	Content in percent (%) [*]
N-[3-(trimethoxysilyl)propyl]butylamine		31024-56-3	

^{*} All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

Composition information of impurities and stabilizers

Chemical Identity	Common name and synonyms	CAS number	Content in percent (%) [*]
methanol	No data available.	67-56-1	<1%

^{*} All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

The exact concentration has been withheld as a trade secret.

4. First-aid measures

Description of first aid measures

General information:	Immediately remove contaminated clothing.
Inhalation:	If aerosol or mists are formed: Move to fresh air. Get medical attention if any discomfort continues.
Skin Contact:	Wash off immediately with plenty of water. If skin irritation persists, call a physician.
Eye contact:	With eye held open, thoroughly rinse immediately with plenty of water for at least 10 minutes. Continue rinsing process with eye rinsing solution. Protect unharmed eye. Call ambulance. (Cue: caustic burn of the eyes) Immediate further treatment in eye clinic/by eye doctor. continue rinsing eye until arrival at ophthalmic hospital.
Ingestion:	Have the mouth rinsed with water. Only when patient fully conscious: Have patient drink plenty of water in small sips. Get medical attention immediately.
Personal Protection for First-aid Responders:	No data available.

Most important symptoms and effects, both acute and delayed

Symptoms:	After absorbing large amounts of substance: Liberation of reaction products (Methanol) can lead to symptoms of poisoning. Possible signs of poisoning: daze, dizziness, nausea, colicky abdominal pain, respiratory disturbance. Symptoms upon increasing intoxication: dysopia, loss of eyesight.
Hazards:	None known.

Indication of immediate medical attention and special treatment needed

Treatment:	If required, therapy of irritative effect. Treatment Early endoscopy in order to assess mucosa lesions in the oesophagus and stomach which may appear. If necessary, aspirate leftover substance. Detection of substance (Methanol) possible in: Blood Antidote treatment: ethanol.
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5. Fire-fighting measures

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: Water spray, foam, dry powder or carbon dioxide.

Unsuitable extinguishing media: High volume water jet.

Special hazards arising from the substance or mixture:

Hazardous fumes in fires, specific to the product: Nitrogen Oxides

Special protective equipment and precautions for firefighters

Special fire fighting procedures:

Water used to extinguish fire should not enter drainage systems, soil or stretches of water. Ensure there are sufficient retaining facilities for water used to extinguish fire. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

Special protective equipment for fire-fighters:

In case of fire: wear a self contained respiratory apparatus

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Use personal protective equipment.

Accidental release measures:

No data available.

Methods and material for containment and cleaning up:

Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Transfer into suitable containers. To be disposed of in compliance with existing regulations.

Environmental Precautions:

Do not allow entrance in sewage water, soil stretches of water, groundwater, drainage systems.

7. Handling and storage

Handling

Technical measures:

No data available.

Local/Total ventilation:

Application, processing: Provide good ventilation or extraction.

Safe handling advice:

Application, processing: Provide good ventilation or extraction. Handle in accordance with good industrial hygiene and safety practice. If workplace exposure limits are exceeded and/or larger amounts are released (leakage, spilling, dust) the indicated respiratory protection should be used. If there is the possibility of skin/eye contact, the indicated hand/eye/body protection should be used. Use protective clothing / face shield if necessary. Do not breathe in vapours or aerosols. Avoid contact with skin and eyes.

Contact avoidance measures:

No data available.

Storage

Safe storage conditions:

The product has an intermediate conductivity (static conductivity 100-10,000 pS/m) Liquids with a low conductivity (static conductivity < 100 pS/m) or intermediate conductivities (static conductivity 100 pS/m - 10,000 pS/m) might become electrostatically charged and thus present potential sources ignition. Germany: Technical Rules for Hazardous Substances - Prevention of the Risk of Ignition as a Result of Electrostatic Charges EU: NFPA 77, Recommended Practice on Static Electricity Take action to prevent static discharges. Keep away from sources of ignition - No smoking. Keep containers tightly closed in a cool, well-ventilated place. Protect from moisture.

Safe packaging materials:

No data available.

8. Exposure controls/personal protection

Control Parameters

Occupational Exposure Limits

Observe national threshold limit values.

Biological Limit Values

No biological exposure limits noted for the ingredient(s).

Appropriate Engineering Controls

Application, processing: Provide good ventilation or extraction.

Individual protection measures, such as personal protective equipment (PPE)

General information:

No data available.

Eye/face protection:

close-fitting protective goggles (e.g. closed goggles)

Hand Protection:

Material: Butyl rubber.
Break-through time: \geq 480 min
Glove thickness: 0,5 mm
Material: Fluorinated rubber (Viton)
Break-through time: \geq 480 min
Glove thickness: 0,4 mm
Additional Information: Selection of protective gloves to meet the requirements of specific workplaces., The suitability for a specific workplace should be discussed with the producers of the protective gloves., The information is based on our own tests, references from the literature and information from glove manufacturers, or derived by analogy with similar materials., Be aware that in daily use the durability of a chemical resistant protective glove can be notably shorter than the break through time measured according to EN 374, due to the numerous outside influences (e.g. temperature).

Other:

suitable protective clothing - Use disposable clothing if appropriate.

Respiratory Protection:

In case of dusts/vapours/aerosols being formed or if the limit values like TLV are exceeded: use respiratory equipment with suitable filter (filter type ABEK) or wear a self contained respiratory apparatus Use only respiratory protection equipment with CE-symbol including four digit test number. The filter class for the respirator must be suitable for the maximum expected contaminant concentration (gas/vapor/aerosol/particulates) that may arise when handling the product. If this concentration is exceeded, self-contained breathing apparatus must be used. Note time limit for wearing respiratory protective equipment.

Hygiene measures:

When using, do not eat, drink or smoke. Wash face and/or hands before break and end of work. Take off immediately all contaminated clothing. Wash contaminated clothing before reuse.

9. Physical and chemical properties
Information on basic physical and chemical properties
Appearance

Physical state:	liquid
Form:	liquid
Color:	Colorless yellowish greenish
Odor:	slightly ammoniacal
Odor Threshold:	No data available.
Freezing point:	< -119 °C/< -182 °F Method: OECD 102
Boiling Point:	248 °C/478 °F 1.013 hPa Method: OECD 103
Flammability:	No data available.
Upper/lower limit on flammability or explosive limits	
Explosive limit - upper:	No data available.
Explosive limit - lower:	No data available.
Flash Point:	> 95 °C/> 203 °F Method: DIN EN ISO 2719
Auto-ignition temperature:	250 °C/482 °F 1.013 hPa Method: EC Method A.15
Decomposition Temperature:	No data available.
pH:	10,9 20 g/l 20 °C/68 °F
Viscosity	
Dynamic viscosity:	No data available.

Kinematic viscosity:	2,8 mm ² /s 20 °C/68 °F , Method: QSAR
Flow Time:	No data available.
Solubility(ies)	
Solubility in Water:	13 g/l 20 °C/68 °F Method: QSAR not miscible decomposition by hydrolysis hydrolysis product Very Soluble
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	-1,47 Method: QSAR-3,91 Method: QSAR hydrolysis product
Vapor pressure:	4,04 Pa 25 °C/77 °F Method: QSAR < 0,001 Pa 25 °C/77 °F Method: QSAR hydrolysis product
Relative density:	No data available.
Density:	0,95 g/cm ³ 20 °C/68 °F Method: OECD 109
Bulk density:	No data available.
Relative vapor density:	No data available.
Other information	
Explosive properties:	Not explosive
Oxidizing properties:	The substance or mixture is not classified as oxidizing.
Pyrophoric properties:	Based on available data, the classification criteria are not met.
Peroxides:	Not applicable

10. Stability and reactivity

Reactivity:	No dangerous reaction known under conditions of normal use.
Chemical Stability:	Stable under recommended storage conditions.
Possibility of hazardous reactions:	Exothermic reaction with: acids
Conditions to avoid:	Protect from moisture.

Incompatible Materials:	Acids.
Hazardous Decomposition Products:	Methanol in case of hydrolysis. Alcohol formed by hydrolysis lowers the flash point of the product.

11. Toxicological information

Information on likely routes of exposure

Inhalation:	Information on effects are given below.
Skin Contact:	Information on effects are given below.
Eye contact:	Information on effects are given below.
Ingestion:	Information on effects are given below.

Acute toxicity (list all possible routes of exposure)

Oral

Product:	LD 50, Rat, Male, 12.825 mg/kg, OECD 401
Components:	
N-[3-(trimethoxysilyl)propyl]butylamine	LD 50, Rat, Male, 12.825 mg/kg, OECD 401
methanol	LD 50, Rat, 100 mg/kg

Dermal

Product:	LD 50, Rabbit, Male, 15.200 mg/kg, OECD 402
Components:	
N-[3-(trimethoxysilyl)propyl]butylamine	LD 50, Rabbit, Male, 15.200 mg/kg, OECD 402
methanol	LD 50, Rat, 300 mg/kg

Inhalation

Product:	Not classified for acute toxicity based on available data.
Components:	
N-[3-(trimethoxysilyl)propyl]butylamine	Dust and mist, Not toxic after single exposure, In accordance with Section 8.5 in column 2 of REACH Annex VIII, no testing of the acute inhalation toxicity is required.
methanol	Vapour, Not toxic after single exposure, Not applicable LC 50, Acute toxicity estimate, 4 h, 3 mg/l, Vapour LC 50, Acute toxicity estimate, 4 h, > 0,5 mg/l, Dust and mist

Repeated dose toxicity

Product:	NOAEL Rat, Female, Male, Oral, 90 day, 7 days a week, 500 mg/kg
Components:	
N-[3-(trimethoxysilyl)propyl]butylamine	NOAEL Rat, Female, Male, Oral, 90 day, 7 days a week, 500 mg/kg
methanol	No data available.

Skin Corrosion/Irritation

Product:	Irritating., OECD 404, (Rabbit), (analogy)
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Components:

N-[3-(trimethoxysilyl)propyl]butylamine
 Irritating., OECD 404, Rabbit, (analogy)

methanol
 Not irritating, Rabbit, Literature

Serious Eye Damage/Eye Irritation

Product: Risk of serious damage to eyes., OECD 405, Rabbit, (analogy)

Components:

N-[3-(trimethoxysilyl)propyl]butylamine
 Risk of serious damage to eyes., OECD 405, Rabbit, (analogy)

methanol
 Not irritating, Rabbit

Respiratory or Skin Sensitization

Product: Buehler Test, OECD 406, Guinea Pig, Not a skin sensitizer.

Components:

N-[3-(trimethoxysilyl)propyl]butylamine
 Buehler Test, OECD 406, Guinea Pig, Not a skin sensitizer.

methanol
 Maximization Test, OECD 406, Guinea Pig, Not a skin sensitizer.

Carcinogenicity

Product: No evidence that cancer may be caused.

Components:

N-[3-(trimethoxysilyl)propyl]butylamine
 No evidence that cancer may be caused.

methanol
 Not classified

Germ Cell Mutagenicity
In vitro

Product: Ames test, OECD 471: , negative
 gene mutation test, OECD 476: , negative, (analogy)
 Chromosomal aberration, OECD 473: , negative, (analogy)

Components:

N-[3-(trimethoxysilyl)propyl]butylamine
 Ames test, OECD 471: , negative
 gene mutation test, OECD 476: , negative, (analogy)
 Chromosomal aberration, OECD 473: , negative, (analogy)

methanol
 Ames test, OECD 471: , negative
 gene mutation test, OECD 476: , negative
 Micronucleus test: , negative

In vivo

Product: No data available.

Components:

N-[3-(trimethoxysilyl)propyl]butylamine
 No data available.

methanol	Micronucleus test, OECD 474, Intraperitoneal, Mouse, Female, Male, negative Chromosomal aberration, Intraperitoneal, Mouse, Female, Male, negative
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Reproductive toxicity

Product: No data available.

Components:
 N-[3-(trimethoxysilyl)propyl]butylamine
 methanol

No data available.
 Not classified

Specific Target Organ Toxicity - Single Exposure

Product: No data available.

Components:
 N-[3-(trimethoxysilyl)propyl]butylamine
 methanol

No data available.
 Dermal Oral Inhalation - vapor, optic nerve, Central nervous system., Category 1 Causes damage to organs.

Specific Target Organ Toxicity - Repeated Exposure

Product: No data available.

Components:
 N-[3-(trimethoxysilyl)propyl]butylamine
 methanol

No data available.
 No data available.

Aspiration Hazard

Product: No evidence of aspiration toxicity

Components:
 N-[3-(trimethoxysilyl)propyl]butylamine
 methanol

Not classified
 Not classified

Information on health hazards

Other hazards

Product: No data available.

12. Ecological information

Ecotoxicity:

Acute hazards to the aquatic environment:

Fish

Product: LC 50, Brachydanio rerio (zebrafish), 96 h, > 100 mg/l OECD 203, (analogy)

Components:
 N-[3-

LC 50, Brachydanio rerio (zebrafish), 96 h, > 100 mg/l OECD 203,

(trimethoxysilyl)propyl]butylamine
 methanol (analogy)
 LC 50, Bluegill Sunfish, 96 h, 15.400 mg/l US-EPA-method, Literature

Aquatic Invertebrates

Product: EC 50, Daphnia magna, 48 h, > 100 mg/l OECD 202, (analogy)

Components:
 N-[3-(trimethoxysilyl)propyl]butylamine EC 50, Daphnia magna, 48 h, > 100 mg/l OECD 202, (analogy)

methanol EC 50, Daphnia magna, 96 h, 18.260 mg/l OECD 202, Literature

Toxicity to Aquatic Plants

Product: EC 50 (Desmodesmus subspicatus (Scenedesmus subspicatus), 72 h): > 100 mg/l (OECD 201) (analogy)

Components:
 N-[3-(trimethoxysilyl)propyl]butylamine EC 50 (Desmodesmus subspicatus (Scenedesmus subspicatus), 72 h): > 100 mg/l (OECD 201) (analogy)

methanol EC 50 (Selenastrum capricornutum (green algae), 96 h): Approximate 22.000 mg/l (OECD 201) Literature

Toxicity to microorganisms

Product: EC 50, local activated sludge, 3 h, > 1.000 mg/l, OECD 209, (analogy)

Components:
 N-[3-(trimethoxysilyl)propyl]butylamine EC 50, local activated sludge, 3 h, > 1.000 mg/l, OECD 209, (analogy)

methanol EC 50, activated sludge, 3 h, > 1.000 mg/l, OECD 209, Literature

Chronic hazards to the aquatic environment:

Fish

Product: No data available.

Components:
 N-[3-(trimethoxysilyl)propyl]butylamine No data available.

methanol No data available.

Aquatic Invertebrates

Product: No data available.

Components:
 N-[3-(trimethoxysilyl)propyl]butylamine No data available.

methanol No data available.

Toxicity to Aquatic Plants

Product: NOEC (Desmodesmus subspicatus (Scenedesmus subspicatus), 72 h): 22 mg/l (OECD 201) (analogy)

Components:
 N-[3-(trimethoxysilyl)propyl]butylamine NOEC (Desmodesmus subspicatus (Scenedesmus subspicatus), 72 h): 22 mg/l (OECD 201) (analogy)

ylamine
 methanol No data available.

Toxicity to microorganisms

Product: EC 50, local activated sludge, 3 h, > 1.000 mg/l, OECD 209, (analogy)
Components:
 N-[3-(trimethoxysilyl)propyl]butylamine
 EC 50, local activated sludge, 3 h, > 1.000 mg/l, OECD 209, (analogy)
 methanol EC 50, activated sludge, 3 h, > 1.000 mg/l, OECD 209, Literature

Persistence and Degradability

Biodegradation

Product: 24,7 %, 28 d, OECD 301 B, The product is not biodegradable., aerobic
Components:
 N-[3-(trimethoxysilyl)propyl]butylamine
 24,7 %, 28 d, OECD 301 B, The product is not biodegradable., aerobic
 methanol 98 %, 28 d, (DOC; modif. OECD screening test / OECD 301 E), Own study The product is easily biodegradable., aerobic

BOD/COD Ratio

Product: No data available.
Components:
 N-[3-(trimethoxysilyl)propyl]butylamine
 No data available.
 methanol No data available.

Bioaccumulative potential

Bioconcentration Factor (BCF)

Product: low
Components:
 N-[3-(trimethoxysilyl)propyl]butylamine
 low
 methanol Leuciscus idus (Golden orfe), < 10, Measured, No significant bioaccumulation.

Partition Coefficient n-octanol / water (log Kow)

Product: -1,47, 20 °C, QSAR
 -3,91, 20 °C, QSAR, hydrolysis product
Components:
 N-[3-(trimethoxysilyl)propyl]butylamine
 -1,47, 20 °C, QSAR
 -3,91, 20 °C, QSAR, hydrolysis product
 methanol -0,77

Mobility in soil:

Product Log Koc: 1,19 Koc: 15,49 QSAR) hydrolysis product Adsorption on the floor: low.

Components:

N-[3-(trimethoxysilyl)propyl]butylamine	Log Koc: 1,19 Koc: 15,49 QSAR) hydrolysis product Adsorption on the floor: low.
methanol	soil - Log Koc: 1 calculated) Not expected to adsorb on soil.

Other adverse effects:

Other hazards

Product: The data we have at our disposal do not necessitate identification concerning environmental hazard.

13. Disposal considerations

Disposal methods: With respect to local regulations, e.g. dispose of to suitable waste incineration plant.

Contaminated Packaging: Do not reuse empty containers and dispose of in accordance with the regulations issued by the appropriate local authorities. If there is product residue in the emptied container, follow directions for handling on the container's label. Incorrect disposal or reuse of this container is illegal and can be dangerous. Other countries: observe the national regulations.

14. Transport information

International Regulations

UNRTDG

Not regulated as a dangerous good

IATA-DGR

Not regulated as a dangerous good

IMDG-Code

Not regulated as a dangerous good

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable for product as supplied.

15. Regulatory information

International regulations

Montreal protocol

Not applicable

Stockholm convention

Not applicable

Rotterdam convention

Not applicable

Kyoto protocol

Not applicable

16. Other information, including date of preparation or last revision**Issue Date:** 25.03.2019**Version #:** 2.1**Abbreviations and acronyms:**

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); EC_x - Concentration associated with x% response; EHS - Extremely Hazardous Substance; EL_x - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErC_x - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC₅₀ - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC₅₀ - Lethal Concentration to 50 % of a test population; LD₅₀ - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Further Information: No data available.**Revision Information:** Changes since the last version are highlighted in the margin. This version replaces all previous versions.

Disclaimer:

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