

Safety Data Sheet

According to Canadian Hazardous Products Regulations and WHMIS 2015

Initial preparation date: 08.11.2023

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Alumina 4N Resin

SECTION 1: Identification

Product identifier

Product name: Alumina 4N Resin

Product code: FLAL4N01

Recommended use of the product and restriction on use

Relevant identified uses: For use in Formlabs SLA Printers

Uses advised against: Not determined or not applicable.

Reasons why uses advised against: Not determined or not applicable.

Manufacturer or supplier details

Manufacturer:

United States

Formlabs, Inc

35 Medford St

Suite 201 Somerville, MA 02143

+1 617 855 0762

sds@formlabs.com

Emergency telephone number:

United States/Canada

CHEMTREC

1-800-424-9300 (24/7)

SECTION 2: Hazard identification

GHS classification:

Skin irritation, category 2

Serious eye damage, category 1

Skin sensitization, category 1

Label elements

Hazard pictograms:



Signal Word: Danger

Hazard statements:

H315 Causes skin irritation

H318 Causes serious eye damage

H317 May cause an allergic skin reaction

Precautionary statements:

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P264 Wash skin thoroughly after handling
P280 Wear protective gloves, protective clothing and eye protection.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray
P272 Contaminated work clothing should not be allowed out of the workplace
P302+P352 IF ON SKIN: Wash with plenty of soap and water
P332+P313 If skin irritation occurs: Get medical advice/attention
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P333+P313 If skin irritation or rash occurs: Get medical advice/attention
P363 Wash contaminated clothing before reuse
P362+P364 Take off contaminated clothing and wash it before reuse
P501 Dispose of contents/container in accordance with local/regional/national regulations

Hazards not otherwise classified:

None

Reactivity with Water

In contact with water, releases gases which are if inhaled.

SECTION 3: Composition/information on ingredients

Identification	Name	Weight %
CAS number: Trade Secret	Acrylate Monomer	5-15
CAS number: Trade Secret	Phenol, ethoxylated	5-10
CAS number: 51728-26-8	Pentaerythritol, ethoxylated, esters with acrylic acid	<5
CAS number: Trade Secret	Photoinitiator(s)	<0.2

Additional Information: None

SECTION 4: First-aid measures

Description of first-aid measures

General notes:

Show this Safety Data Sheet to the doctor in attendance.

After inhalation:

If inhaled, remove person to fresh air and place in a position comfortable for breathing. If respiratory symptoms develop or persist, seek medical advice/attention

After skin contact:

Remove contaminated clothing and shoes. Rinse skin with copious amounts of water [shower] for several minutes. Launder contaminated clothing before reuse. If symptoms develop or persist, seek medical advice/attention.

After eye contact:

Rinse eyes with plenty of water for several minutes. Remove contact lenses if present and easy to do so. Protect unexposed eye. If symptoms develop or persist, seek medical advice/attention.

After ingestion:

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If swallowed, DO NOT induce vomiting unless told to do so by a physician or poison control center. Rinse mouth with water. Never give anything by mouth to an unconscious person. If spontaneous vomiting occurs, place on the left side with head down to prevent aspiration of liquid into the lungs. If symptoms develop or persist, seek medical advice/attention.

Most important symptoms and effects, both acute and delayed

Acute symptoms and effects:

Skin contact may result in redness, pain, burning and inflammation.

Eye contact may result in irritation, redness, pain, inflammation, itching, burning, tearing, corneal damage and loss of vision.

Dermal exposure may cause an allergic skin reaction. Symptoms may include irritation, redness, pain, rash, inflammation, itching, burning and dermatitis.

Delayed symptoms and effects:

Effects are dependent on exposure (dose, concentration, contact time).

Immediate medical attention and special treatment

Specific treatment:

In case of eye contact, seek prompt medical attention while rinsing is continued.

Notes for the doctor:

Treat symptomatically.

SECTION 5: Fire-fighting measures

Extinguishing media

Suitable extinguishing media:

Water mist/fog, carbon dioxide, dry chemical or alcohol resistant foam.

Unsuitable extinguishing media:

Do not use water jet.

Specific hazards during fire-fighting:

Thermal decomposition may produce irritating/toxic fumes/gases.

Special protective equipment for firefighters:

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full-face piece operated in positive pressure mode.

Special precautions:

Avoid contact with skin, eyes, hair and clothing. Do not breathe fumes/gas/mists/aerosols/vapors/dusts.

Move containers from fire area if safe to do so. Use water spray/fog for cooling fire exposed containers.

Avoid unnecessary run-off of extinguishing media which may cause pollution.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Evacuate unnecessary personnel. Ventilate area. Extinguish any sources of ignition. Wear recommended personal protective equipment (see Section 8). Avoid contact with skin, eyes and clothing. Avoid breathing mist, vapor, dust, fume and spray. Do not walk through spilled material. Wash thoroughly after handling.

Environmental precautions:

Prevent further leakage or spillage if safe to do so. Prevent from reaching drains, sewers and waterways.

Discharge into the environment must be avoided.

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Methods and material for containment and cleaning up:

Do not touch damaged containers or spilled material unless wearing appropriate personal protective clothing. Stop leak if you can do it without risk. Contain and collect spillage and place in suitable container for future disposal. Dispose of in accordance with all applicable regulations (see Section 13).

Reference to other sections:

For personal protective equipment see Section 8. For disposal see Section 13.

SECTION 7: Handling and storage

Precautions for safe handling:

Use appropriate personal protective equipment (see Section 8). Use only with adequate ventilation. Avoid breathing mist/vapor/spray/dust. Do not eat, drink, smoke, or use personal products when handling chemical substances. Avoid contact with skin, eyes and clothing. Wash affected areas thoroughly after handling. Keep away from incompatible materials (See Section 10). Keep containers tightly closed when not in use.

Conditions for safe storage, including any incompatibilities:

Store in cool, dry, well-ventilated location out of direct sunlight. Keep away from food and beverages. Protect from freezing and physical damage. Store away from heat, open flames and other sources of ignition. Keep container tightly sealed. Store away from incompatible materials (See Section 10).

SECTION 8: Exposure controls/personal protection

Only those substances with limit values have been included below.

Occupational Exposure limit values:

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

Biological limit values:

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

Information on monitoring procedures:

Not determined or not applicable.

Appropriate engineering controls:

Emergency eye wash stations and safety showers should be available in the immediate vicinity of use or handling. Provide adequate ventilation to maintain the airborne concentrations of vapor, mists, and/or dusts below the applicable workplace exposure limits, while observing recognized national standards (or equivalent).

Personal protection equipment

Eye and face protection:

Safety glasses or goggles. Use eye protection equipment that has been tested and approved by recognized national standards (or equivalent).

Skin and body protection:

Chemical resistant, impervious gloves approved by the appropriate standards. Gloves must be inspected prior to use. Avoid skin contact with used gloves. Appropriate techniques should be used to remove used gloves and contaminated clothing. Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Ensure that all personal protective equipment is approved by recognized national standards (or equivalent).

Respiratory protection:

If engineering controls do not maintain airborne concentrations below the applicable workplace exposure

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limits, or to an acceptable level (if exposure limits have not been established), a respirator approved by recognized national standards (or equivalent) must be worn.

General hygienic measures:

When handling chemical products, do not eat, drink or smoke. Wash hands after handling, before breaks, and at the end of the workday. Avoid contact with skin, eyes and clothing. Wash contaminated clothing before reuse. Perform routine housekeeping.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Appearance (physical state, color):	Grey Liquid
Odor:	Characteristic acrylate
Odor threshold:	Not determined or not available.
pH-value:	Not determined or not available.
Melting/Freezing point:	Not determined or not available.
Boiling point/range:	> 100°C
Flash point:	> 93.5°C
Evaporation rate:	Not determined or not available.
Flammability (solid, gaseous):	Not Flammable
Explosion limit upper:	Not determined or not available.
Explosion limit lower:	Not determined or not available.
Vapor pressure:	Not determined or not available.
Vapor density:	Not determined or not available.
Density:	1.6 g/cm ³
Relative density:	Not determined or not available.
Solubilities:	Not determined or not available.
Partition coefficient (n-octanol/water):	Not determined or not available.
Auto/Self-ignition temperature:	Not determined or not available.
Decomposition temperature:	Not determined or not available.
Dynamic viscosity:	920 cps @ 23°C
Kinematic viscosity:	Not determined or not available.
Explosive properties	Not determined or not available.
Oxidizing properties	Not determined or not available.

SECTION 10: Stability and reactivity

Reactivity:

Not reactive under recommended handling and storage conditions.

Chemical stability:

Stable under recommended handling and storage conditions.

Possibility of hazardous reactions:

Hazardous reactions are not anticipated under recommended conditions of handling and storage.

Conditions to avoid:

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Extreme heat, open flames, hot surfaces, sparks, ignition sources and incompatible materials.
Avoid storage >38°C (100°F) and exposure to light/direct sunlight and heat.

Incompatible materials:

Polymerization initiators, including peroxides, strong oxidizing agents, alcohols, copper, copper alloys, carbon steel, iron, rust, and strong bases.

Hazardous decomposition products:

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

Acute toxicity

Assessment: Based on available data, the classification criteria are not met.

Product data: No data available.

Substance data:

Name	Route	Result
Photoinitiator(s)	oral	LD50 Rat: >5000 mg/kg
	dermal	LD50 Rat: >=2000 mg/kg
Acrylate Monomer	oral	LD50 Rat: 4600 mg/kg
	dermal	LD50 Rabbit: >2000 mg/kg
Phenol, ethoxylated	oral	LD50 Rat: 1840 mg/kg
	dermal	LD50 Rabbit: >2214 mg/kg
Pentaerythritol, ethoxylated, esters with acrylic acid	oral	LD50 Rat: >2000 mg/kg
	dermal	LD50 Rat: >2000 mg/kg

Skin corrosion/irritation

Assessment:

Causes skin irritation.

Product data:

No data available.

Substance data:

Name	Result
Acrylate Monomer	Causes skin irritation.
Phenol, ethoxylated	Causes skin irritation.
Pentaerythritol, ethoxylated, esters with acrylic acid	Causes skin irritation.

Serious eye damage/irritation

Assessment:

Causes serious eye damage.

Product data:

No data available.

Substance data:

Name	Result
Acrylate Monomer	Causes serious eye damage.
Phenol, ethoxylated	Causes serious eye damage.

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Name	Result
Pentaerythritol, ethoxylated, esters with acrylic acid	Causes serious eye irritation.

Respiratory or skin sensitization

Assessment:

May cause an allergic skin reaction.

Product data:

No data available.

Substance data:

Name	Result
Photoinitiator(s)	May cause an allergic skin reaction.
Acrylate Monomer	May cause an allergic skin reaction.

Carcinogenicity

Assessment: Based on available data, the classification criteria are not met.

Product data: No data available.

Substance data: No data available.

International Agency for Research on Cancer (IARC):

Name	Classification
Photoinitiator(s)	Not Applicable
Acrylate Monomer	Not Applicable
Phenol, ethoxylated	Not Applicable
Pentaerythritol, ethoxylated, esters with acrylic acid	Not Applicable

National Toxicology Program (NTP):

Name	Classification
Photoinitiator(s)	Not Applicable
Acrylate Monomer	Not Applicable
Phenol, ethoxylated	Not Applicable
Pentaerythritol, ethoxylated, esters with acrylic acid	Not Applicable

Germ cell mutagenicity

Assessment: Based on available data, the classification criteria are not met.

Product data:

No data available.

Substance data: No data available.

Reproductive toxicity

Assessment: Based on available data, the classification criteria are not met.

Product data:

No data available.

Substance data: No data available.

Specific target organ toxicity (single exposure)

Assessment: Based on available data, the classification criteria are not met.

Product data:

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No data available.

Substance data: No data available.

Specific target organ toxicity (repeated exposure)

Assessment: Based on available data, the classification criteria are not met.

Product data:

No data available.

Substance data: No data available.

Aspiration toxicity

Assessment: Based on available data, the classification criteria are not met.

Product data:

No data available.

Substance data: No data available.

Information on likely routes of exposure:

No data available.

Symptoms related to the physical, chemical and toxicological characteristics:

No data available.

Other information:

No data available.

SECTION 12: Ecological information

Acute (short-term) toxicity

Assessment: Based on available data, the classification criteria are not met.

Product data: No data available.

Substance data:

Name	Result
Photoinitiator(s)	Aquatic Plants EC50 Pseudokirchneriella subcapitata: >2.01 mg/L (72 hr [growth rate; read-across])
	Fish LC50 Danio rerio: 1 mg/L (96 hr [read-across])
	Aquatic Invertebrates EC50 Daphnia magna: 3.53 mg/L (48 hr [read-across])
Acrylate Monomer	Fish LC50 Leuciscus idus: 2.2 - 4.64 mg/L (96 hr)
	Aquatic Invertebrates EC50 Daphnia magna: 22.3 mg/L (48 hr [mobility])
	Aquatic Plants EC50 Scenedesmus subspicatus: 16.7 mg/L (72 hr [growth rate])
Pentaerythritol, ethoxylated, esters with acrylic acid	Fish LC50 Danio rerio: 1.76 mg/L (96 hr)
	Aquatic Invertebrates EC50 Daphnia magna: 90.94 mg/L (48 hr [mobility])
	Aquatic Plants EC50 Pseudokirchneriella subcapitata: 100 mg/L (72 hr [growth rate])

Chronic (long-term) toxicity

Assessment: Based on available data, the classification criteria are not met.

Product data: No data available.

Substance data: No data available.

Persistence and degradability

Product data: No data available.

Substance data:

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Name	Result
Photoinitiator(s)	The substance is not readily biodegradable. <10 % degradation in water, measured by O ₂ consumption, after 28 days.
Acrylate Monomer	Substance is readily biodegradable. >90% degradation, measured by DOC removal, after 28 days.
Pentaerythritol, ethoxylated, esters with acrylic acid	The substance is not readily biodegradable. 28% degradation, measured by O ₂ consumption, after 28 days.

Bioaccumulative potential

Product data: No data available.

Substance data:

Name	Result
Photoinitiator(s)	The substance has a low potential for bioaccumulation based on a log K _{ow} of 2.91.
Acrylate Monomer	Bioaccumulation is not expected. Log K _{ow} (aquatic species): 1.68
Pentaerythritol, ethoxylated, esters with acrylic acid	The substance has a low potential for bioaccumulation. Log K _{ow} : <3

Mobility in soil

Product data: No data available.

Substance data:

Name	Result
Photoinitiator(s)	Based on a log K _{oc} of 3.37, adsorption to solid soil phase is expected.
Acrylate Monomer	Adsorption to solid soil phase is not expected. Log K _{oc} : 1
Pentaerythritol, ethoxylated, esters with acrylic acid	The substances is moderately mobil in soil with a moderate potential for adsorption to soil and sediment. K _{oc} at 20 °C: 409

Results of PBT and vPvB assessment

Product data:

PBT assessment: This product does not contain any substances that are assessed to be a PBT.

vPvB assessment: This product does not contain any substances that are assessed to be a vPvB.

Substance data:

PBT assessment:

Acrylate Monomer	The substance is not PBT.
Pentaerythritol, ethoxylated, esters with acrylic acid	The substance is not PBT.

vPvB assessment:

Acrylate Monomer	The substance is not vPvB.
Pentaerythritol, ethoxylated, esters with acrylic acid	The substance is not vPvB.

Other adverse effects: No data available.

SECTION 13: Disposal considerations

Disposal methods:

Do not discharge into public wastewater or surface waters. It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entities.

Contaminated packages:

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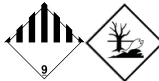
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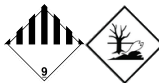
Dispose contaminated packages in a safe manner in accordance with local and national regulations. Do not allow the product to be released into the environment.

SECTION 14: Transport information

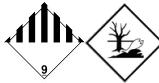
Canadian Transportation of Dangerous Goods (TDG)

UN number	UN 3082
UN proper shipping name	Environmentally hazardous liquid, N.O.S. Pentaerythritol, ethoxylated, esters with acrylic acid
UN transport hazard class(es)	9 
Packing group	III
Environmental hazards	Marine Pollutant
Special precautions for user	None
Additional Information	This product is not regulated as a dangerous good when transported in sizes of $\leq 5L$ or ≤ 5 kg provided the packaging meets the general provisions of TDG schedule 1 provision 99

International Maritime Dangerous Goods (IMDG)

UN number	UN 3082
UN proper shipping name	Environmentally hazardous liquid, N.O.S. Pentaerythritol, ethoxylated, esters with acrylic acid
UN transport hazard class(es)	9 
Packing group	III
Environmental hazards	Marine Pollutant
Special precautions for user	None
Additional Information	This product is not regulated as a dangerous good when transported in sizes of $< 5L$ or < 5 kg provided the packaging meets the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8

International Air Transport Association Dangerous Goods Regulations (IATA-DGR)

UN number	UN 3082
UN proper shipping name	Environmentally hazardous liquid, N.O.S. Pentaerythritol, ethoxylated, esters with acrylic acid
UN transport hazard class(es)	9 
Packing group	III
Environmental hazards	Marine Pollutant
Special precautions for user	None
Additional Information	This product is not regulated as a dangerous good when transported in sizes of $\leq 5L$ or $5 \leq$ kg provided the packaging meet the general provisions of 5.0.2.4.1, 5.0.2.6.1 and 5.0.2.8.

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Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	
Bulk Name	None
Ship type	None
Pollution category	None

SECTION 15: Regulatory information

Canada regulations

Domestic substances list (DSL):

Trade Secret	Photoinitiator(s)	Listed
Trade Secret	Acrylate Monomer	Listed
Trade Secret	Phenol, ethoxylated	Listed
51728-26-8	Pentaerythritol, ethoxylated, esters with acrylic acid	Not Listed

Non-domestic substances list (NDSL):

Trade Secret	Photoinitiator(s)	Not Listed
Trade Secret	Acrylate Monomer	Not Listed
Trade Secret	Phenol, ethoxylated	Not Listed
51728-26-8	Pentaerythritol, ethoxylated, esters with acrylic acid	Listed

Additional information: Not determined.

SECTION 16: Other information

Abbreviations and Acronyms: None

Disclaimer:

This product has been classified in accordance with the Canadian Hazardous Products Regulations and WHMIS 2015. The information provided in this SDS is correct, to the best of our knowledge, based on information available. The information given is designed only as a guidance for safe handling, use, storage, transportation and disposal and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials, unless specified in the text. The responsibility to provide a safe workplace remains with the user.

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End of Safety Data Sheet