

**E-Series® Catalyst**

Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08 Date of first issue: 2009-10-27

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : E-Series® Catalyst

Material : 1108682, 1108006, 1106530, 1104405, 1076780, 1104142, 1092175, 1077170, 1078352, 1078354, 1098646, 1093052, 1078358, 1061165, 1078353, 1078359, 1092176, 1078361, 1078340, 1036631, 1017842, 1035484, 1016708, 1017939, 1031451, 1033973, 1033974, 1034361, 1036632, 1016707

Product code : 000000000000000000 000000000000000000

Recommended use of the chemical and restrictions on use

Recommended use : Chemical intermediate

Restrictions on use : None known.

Manufacturer or supplier's details

Address : Chevron Phillips Chemical Company LP
Specialty Chemicals
9500 Lakeside Blvd.
The Woodlands, TX 77381

Address : CHEVRON PHILLIPS CHEMICALS ASIA PTE. LTD.
C/O DONG WOO CORPORATION
#B-2601, JEONGJAIL-RO,
BUNDANG-GU, SEONGNAMI-SI,
GYEONGGI-DO, 13557
SOUTH KOREA
Telephone no.: +612-9186-1132

Emergency telephone:**Health:**

866.442.9628 (North America)

1.832.813.4984 (International)

Transport:

CHEMTREC 800.424.9300 or 703.527.3887(int'l)

Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090

Mexico CHEMTREC 01-800-681-9531 (24 hours)

South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600

Argentina: +(54)-1159839431

EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Austria: VIZ +43 1 406 43 43 (24 hours/day, 7 days/week)

Belgium: 070 245 245 (24 hours/day, 7 days/week)

Bulgaria: +359 2 9154 233

Croatia: +3851 2348 342 (24 hours/day, 7 days/week)

**E-Series® Catalyst**

Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08 Date of first issue: 2009-10-27

Cyprus: 1401

Czech Republic: Toxicological Information Center +420 224 919 293, +420 224 915 402

Denmark: Danish Poison Center (Giftlinjen): +45 8212 1212

Estonia: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Finland: 0800 147 111 09 471 977 (24 hours/day)

France: ORFILA number (INRS): + 33 (0) 1 45 42 59 59 (24 hours/day, 7 days/week)

Germany: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Greece: (0030) 2107793777 (24 hours/day, 7 days/week)

Hungary: +36-80-201-199 (24 hours/day, 7 days/week)

Iceland: 543 2222 (24 hours/day, 7 days/week)

Ireland: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Italy: POISON CENTER MILAN – Azienda Ospedaliera Niguarda Ca` Grande Tel. +39 02

66101029; POISON CENTER ROME – Policlinico “Agostino Gemelli”, Servizio di tossicologia

clinica Tel. +39 06 3054343; POISON CENTER ROME – Ospedale Pediatrico Bambino Gesù

Tel. +39 06 68593726; POISON CENTER ROME – Policlinico “Umberto I” Tel. +39 06 4997

8000; POISON CENTER FOGGIA – Azienda Ospedaliera Universitaria Riuniti Tel. +39 0881

732326; POISON CENTER NAPLES – Azienda Ospedaliera “Antonio Cardarelli” Tel. +39 081

7472870; POISON CENTER FLORENCE – Azienda Ospedaliera universitaria Careggi Tel.

+39 055 7947819; POISON CENTER PAVIA – IRCCS Fondazione Salvatore Maugeri Tel.

+39 0382 24444; POISON CENTER BERGAMO – Azienda Ospedaliera “Papa Giovanni XXIII”

Tel. 800 883 300; POISON CENTER VERONA – Azienda Ospedaliera Universitaria integrata

Tel. 800 011 858;

Latvia: State Fire and Rescue Service, phone number: 112; Toxicology and Sepsis Clinic Poisoning and Drug Information Center, Hipokrāta 2, Riga, Latvia, LV-1038, phone number +371 67042473. (24 hours.)

Liechtenstein: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Lithuania: +370 (85) 2362052

Luxembourg: (+352) 8002 5500 (24 hours/day, 7 days/week)

Malta: +356 2395 2000

The Netherlands: NVIC: +31 (0)88 755 8000

Norway: 22 59 13 00 (24 hours/day, 7 days/week)

Poland: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Portugal: CIAV phone number: +351 800 250 250

Romania: +40213183606

Slovakia: +421 2 5477 4166

Slovenia: Phone number: 112

Spain: National Emergency Telephone Number of Spanish Poison Centre: +34 91 562 04 20

(24 hours/day, 7 days/week)

Sweden: 112 – ask for Poisons Information

Organization that prepared the SDS : Product Safety and Toxicology Group

E-mail address : SDS@CPChem.com

Website : www.CPChem.com

Appointees : 회사명: 리이치 24 시코리아(주).

**E-Series® Catalyst**

Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08
			Date of first issue: 2009-10-27

주소: 서울시 서초구 헌릉로 7,
외국기업창업지원연구센터
(IKP) 908-909호
전화: +82-1067838981

2. HAZARDS IDENTIFICATION**GHS Classification**

Long-term (chronic) aquatic hazard : Category 2

GHS label elements

Hazard pictograms :



Signal Word : Not applicable

Hazard Statements : H411 Toxic to aquatic life with long lasting effects.

Precautionary Statements : **Prevention:**
P273 Avoid release to the environment.
Response:
P391 Collect spillage.
Disposal:
P501 Dispose of contents and container according to wastes control act.

Other hazards which do not result in classification

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS**Components**

**E-Series® Catalyst**

Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08
			Date of first issue: 2009-10-27

Chemical name	Common Name	CAS-No.	Concentration (% w/w)
Aluminum Oxide	Alumina Oxide	1344-28-1	>= 95 - <= 100
Silver Oxide	disilver oxide	20667-12-3	>= 0.025 - < 0.25
Aluminum Oxide	Alumina Oxide	1344-28-1	>= 95 - <= 100
Silver Oxide	disilver oxide	20667-12-3	>= 0.1 - < 1
None			

4. FIRST AID MEASURES

General advice	: No hazards which require special first aid measures.
In case of eye contact	: Remove contact lenses. Protect unharmed eye. If eye irritation persists, consult a specialist.
In case of skin contact	: If on skin, rinse well with water. Call a physician if irritation develops or persists.
If inhaled	: If unconscious, place in recovery position and seek medical advice. If symptoms persist, call a physician.
If swallowed	: Keep respiratory tract clear. Never give anything by mouth to an unconscious person. If symptoms persist, call a physician.
Most important symptoms and effects, both acute and delayed	: No information available. No information available. No data available No data available
Notes to physician	: No information available. No data available

5. FIRE-FIGHTING MEASURES**Suitable and unsuitable extinguishing media**

Unsuitable extinguishing media	: High volume water jet
Specific hazards during fire fighting	: Do not allow run-off from fire fighting to enter drains or water courses.
Specific extinguishing methods	: Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

**E-Series® Catalyst**

Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08 Date of first issue: 2009-10-27

Special protective equipment : Wear self-contained breathing apparatus for firefighting if necessary for fire-fighters

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Avoid dust formation.

Environmental precautions : Prevent product from entering drains.
If the product contaminates rivers and lakes or drains inform respective authorities.

Methods and materials for containment and cleaning up : Pick up and arrange disposal without creating dust.
Sweep up and shovel.
Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Advice on protection against fire and explosion : Provide appropriate exhaust ventilation at places where dust is formed.

Advice on safe handling : For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.

Conditions for safe storage : Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Electrical installations / working materials must comply with the technological safety standards.

Materials to avoid : No materials to be especially mentioned.

Further information on storage stability : No decomposition if stored and applied as directed.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION**Ingredients with workplace control parameters**

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Aluminum Oxide	1344-28-1	TWA	10 mg/m3	KR OEL
		TWA (Respirable par-	1 mg/m3 (Aluminum)	ACGIH

**E-Series® Catalyst**

Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08 Date of first issue: 2009-10-27

		ticulate matter)		
Silver Oxide	20667-12-3	TWA (Dust and fume)	0.1 mg/m3 (Silver)	ACGIH
Aluminum Oxide	1344-28-1	TWA	10 mg/m3	KR OEL
		TWA (Respirable particulate matter)	1 mg/m3 (Aluminum)	ACGIH

Other ingredients, which are listed in section 3 but not listed in this section, do not have established occupational exposure limit values.

Engineering measures : Adequate ventilation to control airborne concentrations below the exposure guidelines/limits. Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment. Among the following personal protective equipment, the PPEs which require safety certification need to be certified by KOSHA.

Respiratory protection : If ventilation or other engineering controls are not adequate to maintain minimal oxygen content of 19.5% by volume under normal atmospheric pressure, a supplied-air NIOSH approved respirator may be appropriate. A positive pressure, air-supplying respirator may be appropriate if there is potential for uncontrolled release, aerosolization, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection.

Eye protection : Eye wash bottle with pure water
Safety glasses

Hand protection

Remarks : The suitability for a specific workplace should be discussed with the producers of the protective gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion,

**E-Series® Catalyst**

Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08
			Date of first issue: 2009-10-27

Skin and body protection	: and the contact time. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough.
Hygiene measures	: Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.
	: General industrial hygiene practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: Pellets
Color	: White to off-white
Odor	: No data available
Odor Threshold	: No data available
pH	: Not applicable
Pour point	: Not applicable
Boiling point/boiling range	: Not applicable
Flash point	: Not applicable
Evaporation rate	: Not applicable
Self-ignition	: No data available
Upper explosion limit / Upper flammability limit	: Not applicable
Lower explosion limit / Lower flammability limit	: Not applicable
Vapor pressure	: Not applicable
Solubility(ies)	
Water solubility	: Insoluble
Relative vapor density	: Not applicable
Relative density	: No data available
Density	: 70 - 80 LB/FT3

SAFETY DATA SHEET

**E-Series® Catalyst**

Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08
			Date of first issue: 2009-10-27

Partition coefficient: n-octanol/water	:	Not applicable
Decomposition temperature	:	No data available
Viscosity	:	
Viscosity, kinematic	:	Not applicable
Oxidizing properties	:	No
Molecular weight	:	Not applicable

10. STABILITY AND REACTIVITY

Chemical stability and possibility of hazardous reactions	:	Reactivity: Stable under recommended storage conditions. Chemical stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure. Possibility of hazardous reactions: Hazardous polymerization does not occur. Possibility of hazardous reactions: Dust may form explosive mixture in air. Reacts violently with water. Possibility of hazardous reactions: Stable under recommended storage conditions. No hazards to be specially mentioned.
Conditions to avoid	:	No data available
Incompatible materials	:	No data available
Hazardous decomposition products	:	Metal Oxides

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure	:	No data available
--	---	-------------------

Health hazard information**Acute toxicity****Product:**

Acute oral toxicity	:	Acute toxicity estimate: > 5,000 mg/kg Method: Calculation method
---------------------	---	--

Acute inhalation toxicity	:	Acute toxicity estimate: > 10 mg/l
---------------------------	---	------------------------------------

SDS Number:100000014208

8/22

**E-Series® Catalyst**

Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08 Date of first issue: 2009-10-27

Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Acute dermal toxicity : Remarks: No data available

Components:**Aluminum Oxide:**

Acute oral toxicity : LD50 (Rat): > 10,000 mg/kg
Method: OECD Test Guideline 401
Assessment: Not harmful

Acute inhalation toxicity : LC50 (Rat): > 2.3 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Assessment: The substance or mixture has no acute inhalation toxicity
Remarks: Information given is based on data obtained from similar substances.

Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity
Remarks: Information given is based on data obtained from similar substances.

Aluminum Oxide:

Acute oral toxicity : LD50 (Rat): > 10,000 mg/kg
Method: OECD Test Guideline 401
Assessment: Not harmful

Acute inhalation toxicity : LC50 (Rat): > 2.3 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: OECD Test Guideline 403
Assessment: The substance or mixture has no acute inhalation toxicity
Remarks: Information given is based on data obtained from similar substances.

Acute dermal toxicity : LD50 (Rabbit): > 2,000 mg/kg
Assessment: The substance or mixture has no acute dermal toxicity

**E-Series® Catalyst**

Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08
			Date of first issue: 2009-10-27

Remarks: Information given is based on data obtained from similar substances.

Skin corrosion/irritation**Product:**

Result : No skin irritation

Components:**Aluminum Oxide:**

Method : OECD Test Guideline 404
Result : No skin irritation

Silver Oxide:

Result : No skin irritation

Aluminum Oxide:

Method : OECD Test Guideline 404
Result : No skin irritation

Silver Oxide:

Result : No skin irritation

Serious eye damage/eye irritation**Product:**

Remarks : Product dust may be irritating to eyes, skin and respiratory system.

Components:**Aluminum Oxide:**

Result : No eye irritation
Method : OECD Test Guideline 405

Silver Oxide:

Result : Irreversible effects on the eye

Aluminum Oxide:

Result : No eye irritation

**E-Series® Catalyst**

Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08
			Date of first issue: 2009-10-27

Method : OECD Test Guideline 405

Silver Oxide:

Result : Irreversible effects on the eye

Respiratory or skin sensitization**Skin sensitization**

Did not cause sensitization on laboratory animals.

Skin sensitization

Information refers to the main ingredient.

Product:

Result : No data available

Components:**Aluminum Oxide:**

Species : Guinea pig
Result : Did not cause sensitization on laboratory animals.

Aluminum Oxide:

Species : Guinea pig
Result : Did not cause sensitization on laboratory animals.

Carcinogenicity**Components:****Aluminum Oxide:**

No data available

Aluminum Oxide:

No data available

Germ cell mutagenicity**Components:****Aluminum Oxide:**

No data available

**E-Series® Catalyst**

Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08
			Date of first issue: 2009-10-27

Genotoxicity in vitro : Test Type: Ames test
Metabolic activation: with and without metabolic activation
Result: negative

Aluminum Oxide:

No data available

Genotoxicity in vitro : Test Type: Ames test
Metabolic activation: with and without metabolic activation
Result: negative

Reproductive toxicity**Components:****Aluminum Oxide:**

No data available

Aluminum Oxide:

No data available

STOT-single exposure**Product:**

Remarks : Not classified

STOT-repeated exposure**Product:**

Remarks : Not classified

Repeated dose toxicity

No data available

Aspiration toxicity

No data available

Experience with human exposure

No data available

Toxicology, Metabolism, Distribution

No data available

**E-Series® Catalyst**

Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08
			Date of first issue: 2009-10-27

Neurological effects

No data available

Further information**Product:**

Remarks : No data available

12. ECOLOGICAL INFORMATION**Ecotoxicity****Components:****Aluminum Oxide:**

Toxicity to fish : NOEC (Salmo salar (Atlantic salmon)): > 100 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : NOEC (Selenastrum capricornutum (algae)): > 100 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Ecotoxicology Assessment

Acute aquatic toxicity : This material is not expected to be harmful to aquatic organisms.

Chronic aquatic toxicity : This material is not expected to be harmful to aquatic organisms.

Silver Oxide:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 1.2 µg/l
Exposure time: 96 h
Test Type: semi-static test

Toxicity to daphnia and other aquatic invertebrates : LC50 (Daphnia magna (Water flea)): 0.22 µg/l
Exposure time: 48 h
Test Type: semi-static test

**E-Series® Catalyst**

Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08 Date of first issue: 2009-10-27

Toxicity to algae/aquatic plants : EC10 (Chlamydomonas reinhardtii (green algae)): 0.54 µg/l
Exposure time: 24 h
Test Type: Growth inhibition

M-Factor (Acute aquatic toxicity) : 100

M-Factor (Chronic aquatic toxicity) : 100

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

Aluminum Oxide:

Toxicity to fish : NOEC (Salmo salar (Atlantic salmon)): > 100 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : NOEC (Selenastrum capricornutum (algae)): > 100 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Ecotoxicology Assessment

Acute aquatic toxicity : This material is not expected to be harmful to aquatic organisms.

Chronic aquatic toxicity : This material is not expected to be harmful to aquatic organisms.

Silver Oxide:

Toxicity to fish : LC50 (Pimephales promelas (fathead minnow)): 1.2 µg/l
Exposure time: 96 h
Test Type: semi-static test

Toxicity to daphnia and other aquatic invertebrates : LC50 (Daphnia magna (Water flea)): 0.22 µg/l
Exposure time: 48 h
Test Type: semi-static test

Toxicity to algae/aquatic plants : EC10 (Chlamydomonas reinhardtii (green algae)): 0.54 µg/l
Exposure time: 24 h

**E-Series® Catalyst**

Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08
			Date of first issue: 2009-10-27

Test Type: Growth inhibition

M-Factor (Acute aquatic toxicity) : 100

M-Factor (Chronic aquatic toxicity) : 100

Ecotoxicology Assessment

Acute aquatic toxicity : Very toxic to aquatic life.

Chronic aquatic toxicity : Very toxic to aquatic life with long lasting effects.

Persistence and degradability**Components:****Aluminum Oxide:**

Biodegradability : Remarks: The methods for determining biodegradability are not applicable to inorganic substances.

Silver Oxide:

Biodegradability : Remarks: The methods for determining biodegradability are not applicable to inorganic substances.

Aluminum Oxide:

Biodegradability : Remarks: The methods for determining biodegradability are not applicable to inorganic substances.

Silver Oxide:

Biodegradability : Remarks: The methods for determining biodegradability are not applicable to inorganic substances.

Bioaccumulative potential**Components:****Aluminum Oxide:**

Bioaccumulation : Remarks: This material is not expected to bioaccumulate.

Silver Oxide:

Bioaccumulation : Remarks: No data available

Aluminum Oxide:

**E-Series® Catalyst**

Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08
			Date of first issue: 2009-10-27

Bioaccumulation : Remarks: This material is not expected to bioaccumulate.

Silver Oxide:

Bioaccumulation : Remarks: No data available

Mobility in soil**Components:****Aluminum Oxide:**

Mobility : Remarks: No data available

Silver Oxide:

Mobility : Remarks: No data available

Aluminum Oxide:

Mobility : Remarks: No data available

Silver Oxide:

Mobility : Remarks: No data available

Other adverse effects**Product:**

Additional ecological information : Toxic to aquatic life with long lasting effects.

Components:**Aluminum Oxide:**

Results of PBT and vPvB assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Aluminum Oxide:

Results of PBT and vPvB assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

**E-Series® Catalyst**

Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08
			Date of first issue: 2009-10-27

Endocrine disrupting properties

No data available

13. DISPOSAL CONSIDERATIONS**Disposal methods**

Waste from residues : The product should not be allowed to enter drains, water courses or the soil.

Disposal precautions

Dispose of contents and container according to wastes control act.

14. TRANSPORT INFORMATION**International Regulations****IATA-DGR**

UN/ID No. : UN 3077
Proper shipping name : Environmentally hazardous substance, solid, n.o.s.
()
Class : 9
Packing group : III
Labels : Class 9 - Miscellaneous Dangerous Goods

IMDG-Code

UN number : UN 3077
Proper shipping name : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID,
N.O.S.
()
Class : 9
Packing group : III
Labels : 9
EmS Code : F-A, S-F
Marine pollutant : no

Maritime transport in bulk according to IMO instruments

Not applicable

Domestic regulation

Refer to section 15 for specific national regulation.

Special precautions for user

Remarks : not regulated

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

**E-Series® Catalyst**

Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08
			Date of first issue: 2009-10-27

15. REGULATORY INFORMATION**National regulatory information****Regulation under the Occupational Safety and Health Act****Harmful Substances Prohibited from Manufacturing**

Not applicable

Harmful Substances Required Permission for Manufacture

Not applicable

Harmful Agents to be kept below Occupational Exposure Limits

Chemical name	CAS-No.
α-Alumina	1344-28-1

Harmful Agents Required to be kept below Permission Levels

Not applicable

Hazardous substances requiring management

Chemical name	CAS-No.	Threshold limits (%)
Aluminum and its compounds	1344-28-1	>= 1 %

Special Management Materials

Not applicable

Controlled Substances Subject to Environment Monitoring

Chemical name	CAS-No.	Threshold limits (%)
Aluminum and its compounds	1344-28-1	>= 1 %
Mineral dusts	1344-28-1	

Controlled Substances Subject to Health Examination

Chemical name	CAS-No.	Threshold limits (%)
Aluminum and its compounds	1344-28-1	>= 1 %
Mineral dusts	1344-28-1	

Hazardous Substances Subject to Process Safety Management (PSM) Reporting Obligation

Not applicable

K-OSHA Hazardous Substances (Occupational Safety and Health Regulations, Table 1)

Not applicable

K-OSHA Hazardous Substances (Occupational Safety and Health Regulations, Table 9)

Not applicable

**E-Series® Catalyst**

Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08
			Date of first issue: 2009-10-27

Regulation under the Chemicals Control Act**Restricted Chemicals**

Not applicable

Prohibited Chemicals

Not applicable

Toxic Release Inventory

Chemical name	CAS-No.	Group	Threshold limits (%)
Aluminium and its compounds	1344-28-1	Group II	>= 1 %

Accident Precaution Chemicals

Not applicable

Chemicals of Acute and Chronic Hazard to Human Health and the Environment**Substances Acutely hazardous to humans**

Not applicable

Substances Chronically hazardous to humans

Not applicable

Substances Hazardous to the environment

Not applicable

Accident Precaution Chemicals

Not applicable

Toxic Release Inventory

Chemical name	CAS-No.	Group	Threshold limits (%)
Aluminium and its compounds	1344-28-1	Group II	>= 1 %

Act on Registration and Evaluation of Chemical Substances (K-REACH)**Restricted Chemicals**

Not applicable

Prohibited Chemicals

Not applicable

Substances with Unconfirmed Hazards

Not applicable

**E-Series® Catalyst**

Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08
			Date of first issue: 2009-10-27

Dangerous Substances Safety Management Act

Not Applicable to Dangerous Materials

International Chemical : Neither banned nor restricted
Weapons Convention (CWC)
Schedules of Toxic Chemicals and Precursors

Waste Control Act

Industrial general wastes

Follow article 13 of the act to dispose the product waste

Other requirements in domestic and other countries**The ingredients of this product are reported in the following inventories:**

EU REACH	: A substance or substances in this product is not registered or notified to be registered. Importation or manufacture of this product is still permitted provided that it does not exceed the REACH minimum threshold quantity of the non-regulated substances.
CH INV	: On the inventory, or in compliance with the inventory
TSCA	: On or in compliance with the active portion of the TSCA inventory
DSL	: All components of this product are on the Canadian DSL
AU AIIC	: On the inventory, or in compliance with the inventory
ENCS	: On the inventory, or in compliance with the inventory
KECI	: A substance(s) in this product was not registered, notified to be registered, or exempted from registration by CPChem according to K-REACH regulations.
PICCS	: On the inventory, or in compliance with the inventory
TW TCSI	: On the inventory, or in compliance with the inventory
IECSC	: On the inventory, or in compliance with the inventory

16. OTHER INFORMATION**Further information**

Issuing date : 2009-10-27

**E-Series® Catalyst**

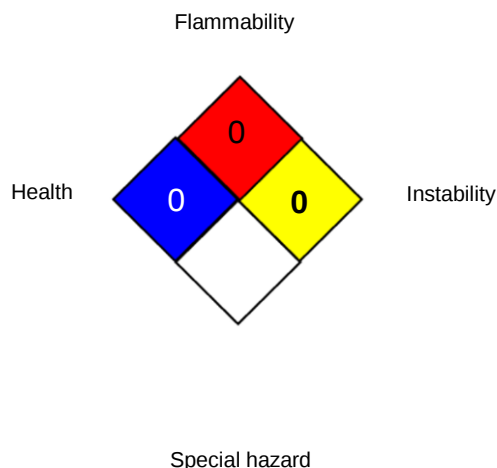
Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08
			Date of first issue: 2009-10-27

Revision number and date

Number of Revision : 2.1
 Revision Date : 2026-08-03
 Other information : None.
 Date format : yyyy/mm/dd

NFPA:**Full text of other abbreviations**

ACGIH : USA. ACGIH Threshold Limit Values (TLV)
 KR OEL : Harmful Agents to be kept below Occupational Exposure Limits

ACGIH / TWA : 8-hour, time-weighted average
 KR OEL / TWA : Time Weighted Average

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardization; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; 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 Or-

**E-Series® Catalyst**

Version 2.1

Revision Date 2026-08-03

Version	Revision Date:	SDS Number (Internal):	MSDS number: AA00974-0000000133
2.1	2026-08-03	100000014208	Date of last issue: 2022-06-08 Date of first issue: 2009-10-27

ganization 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; MERCOSUR - The Agreement for the Facilitation of the Transport of Dangerous Goods; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; 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; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorization and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; 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; WHMIS - Workplace Hazardous Materials Information System

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release 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 or in any process, unless specified in the text.

KR / EN