

## Aluminium oxide

### Substance identity

EC / List no.: 215-691-6

CAS no.: 1344-28-1

Mol. formula: Al<sub>2</sub>O<sub>3</sub>

No image available

### Hazard classification & labelling



**Warning!** According to the classification provided by companies to ECHA in **REACH registrations** this substance is harmful if swallowed and is harmful if inhaled.

At least one company has indicated that the substance classification is affected by impurities or additives.

### About this substance

This substance is manufactured and/or imported in the European Economic Area in 10 000 000+ tonnes per year.

This substance is used in the following products: metal surface treatment products, adhesives and sealants, metal working fluids, metals, cosmetics and personal care products, polymers, welding & soldering products, paper chemicals and dyes, polishes and waxes, lubricants and greases, laboratory chemicals, coating products, textile treatment products and dyes, fillers, putties, plasters, modelling clay, inks and toners, pH regulators and water treatment products, washing & cleaning products, hydraulic fluids, fertilisers, heat transfer fluids, pharmaceuticals, non-metal-surface treatment products, adsorbents, air care products, finger paints, semiconductors, plant protection products, photo-chemicals, biocides (e.g. disinfectants, pest control products), water treatment chemicals, fuels, anti-freeze products, explosives, perfumes and fragrances, water softeners and leather treatment products. This substance has an industrial use resulting in manufacture of another substance (use of intermediates).

This substance is used in the following areas: formulation of mixtures and/or re-packaging, building & construction work, health services, printing and recorded media reproduction, agriculture, forestry and fishing, municipal supply (e.g. electricity, steam, gas, water) and sewage treatment, mining and scientific research and development. This substance is used for the manufacture of: chemicals, mineral products (e.g. plasters, cement), machinery and vehicles, metals, electrical, electronic and optical equipment, fabricated metal products, furniture, plastic products, textile, leather or fur, pulp, paper and paper products, rubber products, wood and wood products and food products.

Release to the environment of this substance can occur from industrial use; formulation of mixtures, formulation in materials, manufacturing of the substance, in the production of articles, in processing aids at industrial sites, as processing aid, of substances in closed systems with minimal release, for thermoplastic manufacture, as an intermediate step in further manufacturing of another substance (use of intermediates), as processing aid, industrial abrasion processing with high release rate (e.g. sanding operations or paint stripping by shot-blasting), industrial abrasion processing with low release rate (e.g. cutting of textile, cutting, machining or grinding of metal) and of articles where the substances are not intended to be released and where the conditions of use do not promote release. Other release to the environment of this substance is likely to occur from: outdoor use in long-life materials with low release rate (e.g. metal, wooden and plastic construction and building materials), indoor use (e.g. machine wash liquids/detergents, automotive care products, paints and coating or adhesives, fragrances and air fresheners), outdoor use, indoor use in long-life materials with low release rate (e.g. flooring, furniture, toys, construction materials, curtains, foot-wear, leather products, paper and cardboard products, electronic equipment), outdoor use in long-life materials with high release rate (e.g. tyres, treated wooden products, treated textile and fabric, brake pads in trucks or cars, sanding of buildings (bridges, facades) or vehicles (ships)), indoor use in close systems with minimal release (e.g. cooling liquids in refrigerators, oil-based electric heaters), outdoor use in close systems with minimal release (e.g. hydraulic liquids in automotive suspension, lubricants in motor oil and break fluids) and indoor use in long-life materials with high release rate (e.g. release from fabrics, textiles during washing, removal of indoor paints).

This substance can be found in complex articles, with no release intended: machinery, mechanical appliances and electrical/electronic products (e.g. computers, cameras, lamps, refrigerators, washing machines), vehicles, electrical batteries and accumulators and Machinery, mechanical appliances, electrical/electronic products covered by the Waste Electrical and Electronic Equipment (WEEE) directive (e.g. refrigerators, washing machines, vacuum cleaners, computers, telephones, drills, saws, smoke detectors, thermostats, radiators). This substance can be found in products with material based on: paper (e.g. tissues, feminine hygiene products, nappies, books, magazines, wallpaper), rubber (e.g. tyres, shoes, toys), stone, plaster, cement, glass or ceramic (e.g. dishes, pots/pans, food storage containers, construction and isolation material), metal (e.g. cutlery, pots, toys, jewellery), fabrics, textiles and apparel (e.g. clothing, mattress, curtains or carpets, textile toys), plastic (e.g. food packaging and storage, toys, mobile phones), wood (e.g. floors, furniture, toys), leather (e.g. gloves, shoes, purses, furniture), stone, plaster, cement, glass and ceramic used for articles with intense direct dermal contact during normal use (e.g. jewellery) and metal used for large surface area articles (e.g. construction and building materials used for roof sheets, pipes). This substance is intended to be released from scented: clothes, paper products, eraser, toys and CDs.

The InfoCard summarises the non-confidential data on substances as held in the databases of the European Chemicals Agency (ECHA), including data provided by third parties. The InfoCard is automatically generated. Information requirements under different legislative frameworks may therefore not be up-to-date or complete. Substance manufacturers and importers are responsible for consulting official publications. This InfoCard is covered by the ECHA Legal Disclaimer.



about INFOCARD - Last updated: 02/06/2017

## Aluminium oxide

Brief Profile - Last updated: 30/01/2018

### Substance Description

#### Substance Identity

No image available

EC / List name: Aluminium oxide

IUPAC name: oxo[(oxoalumanyl)oxy]alumane

Other names

SMILES:

O=[Al]O[Al]=O

InChI:

InChI=1S/2Al.3O  
AuxInfo=1/0/N:1,3;2,4;5/t:A:5AlOAlO0/B:s1;s2;d3;d1;  
/C:3.9751,0,0,2.6537,-.7907,0,1.3321,0,0,-.7694,0,5.  
3125,-.7694,0;

EC / List no.: 215-691-6

CAS no.: 1344-28-1

In CAS registry:

Molecular formula: Al<sub>2</sub>O<sub>3</sub>

Type of substance: Mono constituent substance

Origin: Inorganic

Registered compositions: 52

Of which contain: 8 impurities relevant for classification

0 additives relevant for classification

Substance Listed: EINECS (European Inventory of Existing Commercial chemical Substances) List

### Hazard classification & labelling



Warning! According to the classification provided by companies to ECHA in REACH registrations this substance is harmful if swallowed and is harmful if inhaled.



Additionally, the classification provided by companies to ECHA in CLP notifications identifies that this substance may cause respiratory irritation.

#### Breakdown of all 1664 C&L notifications submitted to ECHA

##### Not Classified

STOT SE 3	H335
STOT RE 1	H372
STOT SE 3	H370
Eye Irrit. 2	H319
Skin Irrit. 2	H315
Carc. 1B	H350
Muta. 2	H341
Repr. 2	H361
Aquatic Chronic 3	H412
Skin Sens. 1	H317
Acute Tox. 4	H302
Acute Tox. 4	H332
STOT RE 2	H373
Flam. Liq. 2	H225

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

☒ Harmonised Classification

☐ REACH registration dossiers notifications

CLP notifications

☒ At least one notifier has indicated that an impurity or an additive present in the substance impacts the notified classification.

### Regulatory activities

#### Registration, Evaluation, Authorisation & Restriction of Chemicals (REACH)

##### Registration

Pre-registration: Substance pre-registered under REACH.

Registration: This substance has 264 active registrations under REACH, 1 Joint Submission(s) and 0 Individual Submission(s).

##### Evaluation

Dossier Evaluation: Registration dossiers submitted to ECHA for this substance have been evaluated under REACH.

##### Substance Evaluation:

##### Authorisation

Annex IV

Annex XIV

##### Restriction

Annex XVII

#### Classification Labelling & Packaging (CLP)

##### Harmonised C&L:

Notification: Classification & Labelling has been notified by industry to ECHA for this substance.

##### Bioicidal Products Regulation (BPR)

Active Substance:

Bioicidal Products:

Prior Informed Consent (PIC)

Annex I:

Annex V:

## About this substance

### General

This substance is manufactured and/or imported in the European Economic Area in 10 000 000+ tonnes per year.

### Product Categories

This substance is used in the following products: metal surface treatment products, adhesives and sealants, metal working fluids, metals, cosmetics and personal care products, polymers, welding & soldering products, paper chemicals and dyes, polishes and waxes, lubricants and greases, laboratory chemicals, coating products, textile treatment products and dyes, fillers, putties, plasters, modelling clay, inks and toners, pH regulators and water treatment products, washing & cleaning products, hydraulic fluids, fertilisers, heat transfer fluids, pharmaceuticals, non-metal-surface treatment products, adsorbents, air care products, finger paints, semiconductors, plant protection products, photo-chemicals, biocides (e.g. disinfectants, pest control products), water treatment chemicals, fuels, anti-freeze products, explosives, perfumes and fragrances, water softeners and leather treatment products. This substance has an industrial use resulting in manufacture of another substance (use of intermediates).

### Sectors of Use

This substance is used in the following areas: formulation of mixtures and/or re-packaging, building & construction work, health services, printing and recorded media reproduction, agriculture, forestry and fishing, municipal supply (e.g. electricity, steam, gas, water) and sewage treatment, mining and scientific research and development. This substance is used for the manufacture of: chemicals, mineral products (e.g. plasters, cement), machinery and vehicles, metals, electrical, electronic and optical equipment, fabricated metal products, furniture, plastic products, textile, leather or fur, pulp, paper and paper products, rubber products, wood and wood products and food products.

### Processes Categories

This substance is used in the following activities or processes at workplace: transfer of chemicals, production of mixtures or articles by tableting, compression, extrusion or pelletisation, the low energy manipulation of substances bound in materials or articles, potentially closed industrial processing with minerals/metals at elevated temperature (e.g. smelters, furnaces, refineries, coke ovens), transfer of substance into small containers, batch processing in synthesis or formulation with opportunity for exposure, mixing in open batch processes, closed batch processing in synthesis or formulation, open transfer and processing with minerals/metals at elevated temperature, handling of solid inorganic substances (e.g. ores and raw metal oxides, packaging/mixing/blending and weighing of metal powders), laboratory work, high energy work-up of substances bound in materials or articles (e.g. hot rolling/forming, grinding, mechanical cutting, drilling or sanding), closed, continuous processes with occasional controlled exposure, treatment of articles by dipping and pouring, industrial spraying, roller or brushing applications, closed processes with no likelihood of exposure, hand mixing with intimate contact only with personal protective equipment available, in materials as fuel sources, with limited exposure to unburned product to be expected, calendaring operations, hot work operations with metals (e.g. welding, soldering, gouging, brazing, flame cutting), heat / pressure transfer fluids in closed systems, non-industrial spraying, blowing agents in manufacture of foam, lubrication at high energy conditions and in partly open process, greasing at high energy conditions, production of metal powders (hot processes) and production of metal powders (wet processes).

### Environmental Release

Release to the environment of this substance can occur from industrial use: formulation of mixtures, formulation in materials, manufacturing of the substance, in the production of articles, in processing aids at industrial sites, as processing aid, of substances in closed systems with minimal release, for thermoplastic manufacture, as an intermediate step in further manufacturing of another substance (use of intermediates), as processing aid, industrial abrasion processing with high release rate (e.g. sanding operations or paint stripping by shot-blasting), industrial abrasion processing with low release rate (e.g. cutting of textile, cutting, machining or grinding of metal) and of articles where the substances are not intended to be released and where the conditions of use do not promote release. Other release to the environment of this substance is likely to occur from: outdoor use in long-life materials with low release rate (e.g. metal, wooden and plastic construction and building materials), indoor use (e.g. machine wash liquids/detergents, automotive care products, paints and coating or adhesives, fragrances and air fresheners), outdoor use, indoor use in long-life materials with low release rate (e.g. flooring, furniture, toys, construction materials, curtains, foot-wear, leather products, paper and cardboard products, electronic equipment), outdoor use in long-life materials with high release rate (e.g. tyres, treated wooden products, treated textile and fabric, brake pads in trucks or cars, sanding of buildings (bridges, facades) or vehicles (ships)), indoor use in close systems with minimal release (e.g. cooling liquids in refrigerators, oil-based electric heaters), outdoor use in close systems with minimal release (e.g. hydraulic liquids in automotive suspension, lubricants in motor oil and brake fluids) and indoor use in long-life materials with high release rate (e.g. release from fabrics, textiles during washing, removal of indoor paints).

### Article Categories

This substance can be found in complex articles, with no release intended: machinery, mechanical appliances and electrical/electronic products (e.g. computers, cameras, lamps, refrigerators, washing machines), vehicles, electrical batteries and accumulators and Machinery, mechanical appliances, electrical/electronic products covered by the Waste Electrical and Electronic Equipment (WEEE) directive (e.g. refrigerators, washing machines, vacuum cleaners, computers, telephones, drills, saws, smoke detectors, thermostats, radiators). This substance can be found in products with material based on: paper (e.g. tissues, feminine hygiene products, nappies, books, magazines, wallpaper), rubber (e.g. tyres, shoes, toys), stone, plaster, cement, glass or ceramic (e.g. dishes, pots/pans, food storage containers, construction and isolation material), metal (e.g. cutlery, pots, toys, jewellery), fabrics, textiles and apparel (e.g. clothing, mattresses, curtains or carpets, textile toys), plastic (e.g. food packaging and storage, toys, mobile phones), wood (e.g. floors, furniture, toys), leather (e.g. gloves, shoes, purses, furniture), stone, plaster, cement, glass and ceramic used for articles with intense direct dermal contact during normal use (e.g. jewellery) and metal used for large surface area articles (e.g. construction and building materials used for roof sheets, pipes). This substance is intended to be released from scented: clothes, paper products, eraser, toys and CDs.

### Precautionary Measures and safe use

ECHA has no data from registration dossiers on the precautionary measures for using this substance. Guidance on the safe use of the substance provided by manufacturers and importers of this substance.





## Active

- 3M Belgium BVBA/SPRL, Hermeslaan 7 1831 Diegem Belgium
- A.G.P., 20 Avenue Reille 75014 Paris France
- A.M.P.E.R.E. ALLOYS, 12 Mail Joliot Curie 95310 SAINT-OUEN-L'AUMONE VAL D'OISE France
- A.M.P.I.S.r.l., Strada Anulare Torre 4 20090 San Felice - Segrate Milan Italy
- ABRASINTYR S.L., providencia 76-78 ento 4º 08024 barcelona Spain
- Advanced Refining Technologies GmbH, In der Hollerhecke 1 67547 Worms Germany
- Advanced Refining Technologies Srl, Via Trento 7 20017 Passirana di Rho (MI) Italy
- Akzo Nobel Pulp and Performance Chemicals AB, EKA Bohus SE-445 60 Bohus Sweden
- Akzo Nobel Pulp and Performance Chemicals Norway AS, Svaldeveien 119 NO-3660 Rjukan Norway
- Alaska Metals Ltd, 25 Berkeley Square W1J 6HN London United Kingdom
- ALBEMARLE CATALYSTS COMPANY B.V., Nieuwendammerkade 1-3 PO Box 37650 1030 BE Amsterdam Netherlands
- Alcan Iceland LTD, Straumsvik P.O. BOX 244 222 Hafnarfjörður Iceland
- Alcoa Fjarðabál sf, Hraun 1 730 Reyðarfjörður Iceland
- ALCOA NORWAY AS, Hoffsvæien 65 B NO-0377 Oslo Norway
- ALCOA TRASFORMAZIONI Srl., Piazza Missori 2 20122 Milano Italy
- Aknatis B.V., Theemsweg 30 NL-3197 Botlek Netherlands
- Almatix B.V. OR INC, Theemsweg 30 3197 KM Botlek Rotterdam Netherlands
- Almatix B.V. OR LTD, Theemsweg 30 3197 KM Botlek Rotterdam Netherlands
- Almatix BV OR Inc., Theemsweg 30 NL-3197 Botlek Netherlands
- Almatix GmbH, Lyoner Str. 9 60528 Frankfurt Germany
- ALRO, 116, Pileștil 230104 Slatina Ol Romanla
- Alteo Gardanna, Route de Biver BP 20062 13541 GARDANNE cedex France
- ALUMINA ESPAÑOLA, S.A., Pedro Teixeira, 8 28020 Madrid Spain
- Aluminium Dunkerque, 17 Place des Reflets La defense 2 92400 Courbevoie France
- ALUMINIUM OF GREECE I.C.S.A., 8 Artemidos 151 25 Maroussi Athens Greece
- Aluminium Oxid Stade GmbH, Johann-Rathje-Köser-Strasse 21683 Stade-Bützfeld Germany
- AMG Superalloys UK Limited, Fullerton Road S60 1DL Rotherham South Yorkshire United Kingdom
- ANF Development OÜ, Tööstuse 48a Tallinn 10416 Tallinn Estonia
- Arc Fused Alumina, 38 rue des Fondateurs 73540 La Bâthie France
- ArcelorMittal Refractories Sp. z o.o., ul. Ujastek 1 30-969 Krakow malopolskie Poland
- Archroma Germany GmbH, Kasteler Str. 45 65203 Wiesbaden Germany
- Arcillas Refractorias, S. A., Barrio Castiello, s/n 33690 Lugo de Llanera Asturias Spain
- August Rüggeberg GmbH & Co. KG, Hauptstr. 13 51709 Marienheide Germany
- AWUKO ABRASIVES Wendmacher GmbH & Co. KG, Hedemündener Str.9 34346 Hann. Münden Germany
- Axens OR, 89, boulevard Franklin Roosevelt B.P. 50802 F-92508 Rueil-Malmaison Cedex France France
- AXENS SA, 89, boulevard Franklin Roosevelt B.P. 50802 F-92508 Rueil-Malmaison Cedex France France
- B-Lands Consulting (8111192-0), World Trade Center, 5 Place Robert Schuman - BP 1510 38025 Grenoble France France
- B-Lands Consulting (811538-8), World Trade Center, 5 Place Robert Schuman, BP 1516 38025 Grenoble France France
- B-Lands Consulting (811543-4), World Trade Center, 5 Place Robert Schuman, BP 1516 38025 Grenoble France France
- Balkowski, BP 501 74339 La Balme de Sillingy cedex France
- BASF Catalysts Germany GmbH, Seligmannallee 1 30173 Hannover Germany
- BASF Italia S.p.A., Via Marconato 8 20811 Cesano Maderno Italy
- BASF Nederland B.V., Groningensingel 1 Postbus 1019 6801 MC Arnhem Netherlands
- BASF Polska Sp. z o.o., Aleje Jerozolimskie 154 02-326 Warszawa Poland
- BASF SE, Carl-Bosch-Str. 38 67056 Ludwigshafen am Rhein Rheinland-Pfalz Germany
- BASF Sonatrach Propanchem S.A., Carretera Nacional 340, km 1.156 43006 Tarragona Spain
- BENS consulting d.o.o., Bakovniška 7 1241 Karnik Slovenia
- BP Chembel NV/SA, Amocolaan 2 2440 Geel Belgium
- Cabot GmbH, Kronenstrasse 2 D-79618 Rheinfelden Germany
- Cambridge Environmental Assessments part of RSK ADAS Ltd, Battlegate Road Boxworth CB23 4NN Cambridge Cambridgeshire United Kingdom
- Carl Spaeter GmbH, Philosophenweg 17 47053 Duisburg Germany
- CATALYST RECOVERY EUROPE S.A., 420, Route de Longwy 4832 Rodange Luxembourg
- CATALYST RECOVERY EUROPE S.A. (OR1), 420, Route de Longwy 4832 Rodange Luxembourg
- CellMark Deutschland GmbH, Hamborner Straße 53 D - 40547 Düsseldorf Germany Germany
- Cerablant GmbH & Co. KG, Gerhard-Rummier-Str.2 74343 Sachsenheim Germany
- Chemical Inspection & Regulation Service Limited, Unit 1 Ardee Business Park, Hale Street Co. Louth Ardee Ireland
- CHEMICAL INSPECTION & REGULATION SERVICE LIMITED, Unit 1 Ardee Business Park, Hale Street Co. Louth Ardee Ireland
- Chemical Inspection & Regulation Service Limited, Unit 1 Ardee Business Park, Hale Street Co. Louth Ardee Ireland
- Chemical Inspection & Regulation Service Limited, Singleton House, Laurence Street Co. Louth Drogheda Ireland
- CHEMICAL INSPECTION & REGULATION SERVICE LIMITED, Singleton House, Laurence Street Co. Louth Drogheda Ireland
- Chemservice S.A. (HSP7), 5, an de Laengten 6776 Grevenmacher Luxembourg
- Clariant Prodotti (Italia) S.p.A., Via Vittor Pisani 20 IT-20124 Milano Italy
- Clariant Produkte (Deutschland) GmbH, Am Unisys-Park 1 65843 Sulzbach am Taunus Germany
- Clariant SE - SDCl, Am Unisyspark 1 65843 Sulzbach am Taunus Germany
- Clariant SE - USCl, Am Unisyspark 1 65843 Sulzbach am Taunus Germany
- CMC Cometa International Sàrl, 33 rue du Puits Romain, Boite 6 Atrium Business Park, Vitrum building 8070 Bertrange Luxembourg
- COMELT S.p.A., Via Sondrio, 4 20063 Cernusco sul Naviglio (MI) Italy
- Corazzi, Paolo Corazzi 26100 Cremona Italy
- CRI Catalyst Company Belgium NV, Ringvaartweg-Wondelgem, 4 B-9032 Wondelgem Belgium
- CRI Catalyst Leuna GmbH, Gebäude 8322 Am Haupttor D-06237 Leuna Leuna Germany
- CSI-OR004, Pentlands Science Park Penicuik EH26 0PZ Edinburgh United Kingdom
- CUMI International Limited, Arch Makarios III Avenue, 284 Fortuna Court, Block B, 2nd Floor P C 3105 Limassol Cyprus
- DCX CHROME SAS, 68 rue Jean Jaurès 59770 Marly France
- Denka Chemicals GmbH, Kaiserswerther Str. 183 40474 Düsseldorf Germany
- Didier-Weike AG, Hagenauer Str. 53-55a 65203 Wiesbaden Germany
- Doerentrup Feuerfestprodukte GmbH&Co.KG, Lemgoer Straße 9 32694 Dörentrup Germany
- Ellusa Trading, Río Guadalbarba, Local 4º 29649 Mijas Costa Malaga Spain
- ENRC Leasing B.V., Only Representative of JSC Aluminium of Kazakhstan, Jan Luijkenstraat 8 bg. 1071 CM Amsterdam Netherlands
- Envigo Consulting Limited, Woolley Road Alconbury PE28 4HS Huntingdon Cambridgeshire United Kingdom
- Eurallumina SpA, Portovesme 09010 Portoscuso Sardegna Italy
- Eurecat Deutschland GmbH, Tricatstrasse 06803 Bitterfeld-Wolfen Saxonia-Anhalt Germany
- EURECAT FRANCE SAS, 121 ave Marie Curie 21 Jean Jaurès 07800 La Vouille sur Rhône France
- Euro Support Advanced Materials B.V., Liessentstraat 9f 5405 AH Uden Netherlands
- Euro Support BV, Kortegracht 26 3811 KH Amersfoort Netherlands
- Euro Support Manufacturing Czechia, s.r.o., Záluží 1 436 70 Litvinov Czech Republic
- EUROMAP S.A., Pl. La Pabilla Urea, 5 46370 Chiva Valencia Spain
- EUROPE NAXMI MINERALS, S.A., GOYA 115, 2ND FLOOR 28009 MADRID MADRID Spain
- Evonik Degussa GmbH, Rellinghauser Strasse 1 - 11 C-ES 45128 Essen North Rhine-Westfalia Germany
- Evonik Resource Efficiency GmbH, Rellinghauser Strasse 1-11 45128 Essen Germany
- Exponent International, The Lenz Hornbeam Business Park HG2 8RE Harrogate North Yorkshire United Kingdom
- ExxonMobil Petroleum & Chemical BVBA ORO3, Polderdijkweg 2030 Antwerpen Belgium
- Ferro GmbH, Gullenstr.215 60327 Frankfurt am Main Germany
- Fosbel GmbH, Schifferstrasse 166 47059 Duisberg Germany
- Fujimi Europe GmbH, Schlossstrasse 5 D-74653 Ingelfingen Germany
- Glencore Import BV, Blaak 31 3011 GA Rotterdam Netherlands
- Glencore International Import BV, Blaak 31 3011 GA Rotterdam Netherlands
- GRACE GmbH & Co. KG, In der Hollerhecke 1 67547 Worms Germany
- GRACE GmbH & Co. KG (OR 4), In der Hollerhecke 1 67547 Worms Germany
- H.C. Starck Tungsten GmbH, Landsberger Str. 98 80339 München Germany
- Haldor Topsoe A/S, Nymøllevej 50 DK28000 Lyngby Denmark
- Hargreaves raw material services GmbH, Böningerstrasse29 47051 Duisburg Germany Germany
- Hellenic Petroleum S.A., 8A Chimarras st. GR 15125 Maroussi Attica Greece
- Henkel Global Supply Chain B.V., Brugwal 11 3432NZ Nieuwegein Netherlands
- Hodge Clemco Ltd, Orgreave Drive S13 9NR Sheffield United Kingdom
- Hydro Aluminium AS, Drammensveien 260 0240 OSLO Norway
- IBU-tec Advanced Materials AG, Hainweg 9-11 D-99425 Weimar Germany
- IC Profil Körlátolt Felelősségű Társaság, Rákóczi utca 5. 1. em 8200 Veszprém Veszprém Hungary
- Imerys Fused Minerals Domodossola s.r.l., Via Pieve 67 28845 Domodossola Italy
- Imerys Fused Minerals Laufenburg GmbH, Ferroweg 1 79725 Laufenburg Baden Germany
- Imerys Fused Minerals Ruse d.o.o., Mariborska cesta 44 2352 Selnica ob Dravi Slovenia
- Imerys Fused Minerals Villach GmbH, Seebach 2 9523 Villach Austria
- Imerys Fused Minerals Villach GmbH\_OR\_CEM, Seebach 2 9523 Landskron Villach Austria
- Imerys Fused Minerals Villach GmbH\_OR\_IFM-NF, Seebach 2 9523 Landskron Villach Austria
- Imerys Fused Minerals Villach GmbH\_OR\_IFM-SA, Seebach 2 9523 Landskron Villach Austria
- Imerys Fused Minerals Zschornowitz GmbH, Burgkennitzerstrasse 17 06791 Zschornowitz Germany
- Imerys Metalcasting Germany GmbH, Duisburger Strasse 69-73 D-46049 Oberhausen Germany
- Imexco-Ullrich GmbH, Buehler Strasse 20 66130 Saarbrücken Germany
- INGENIERIA Y SERVICIOS TECNICOS, S.A., AVENIDA CERVANTES, 6 48970 BASAURI VIZCAYA Spain
- INOYVN France S.A.S., RUE DE CLICHY 25 75009 PARIS France
- Intercat Europe BV, Stationsstraat 50 3451bz Vleuten Netherlands
- INTERTEK FRANCE, ZAC Ecoparc II 27400 HEUDEBOUVILLE France
- JASTAR Jan Szopa, Halina Szopa Sp.J., Żeromskiego 19 20-460 Lublin Lubelskie Poland
- Johnson Matthey Chemicals GmbH, Wardstrasse 17 D-46446 Emmerich am Rhein Germany

- Johnson Matthew PLC, 5th Floor, 25 Farrington Street EQ4A 4AB London United Kingdom
- Kavneer Nederland B.V (OR AWA Brasil), Archimedesstraat 9, 3846 CT Harderwijk Netherlands
- Kavneer Nederland B.V (OR Suiname), Archimedesstraat 9, 3846 CT Harderwijk Netherlands
- KERNEOS SA, 11 cours Valmy - Paris la Défense 92800 Puteaux France
- Klingspor Schleifsysteme GmbH & Co. KG, Hüttenstr. 36 35708 Haiger Germany
- KLINGSPOR Sp.z.o.o., ul T. Regera 58 43-382 Bielsko-Biala Poland
- Kobelco Welding of Europe B.V., Eisterweg 8 6422 PN Heerlen Netherlands
- Komateq a.s./, Komenského 1097/13 05001 Revuca Slovakia
- Kominex Mineralmahlwerk, Am Selkebad 2 06463 Falkenstein/Harz OT Ermsleben Germany
- KominexÖrtömű Kft., Vidor u.10. fest 1172 Budapest Hungary
- Krahn Chemie GmbH, Grimm 10 20457 Hamburg Hamburg Germany
- KROSAKI AMR REFRACTARIOS S.A.U., Polígono Ibalondo, Nº 31 20120 Hernani Spain
- KROSAKI AMR REFRACTARIOS S.A.U., Polígono Ibalondo, 31 20120 Hernani Guipuzcoa Spain
- Kubitzberg Aluminium AB, Landsvägsallén 79 851 76 Sundsvall Sweden
- Kuhmichel Abrasiv Austria GmbH, Ziegelefeldstrasse 5 3430 Tulln Austria
- Kuhmichel Abrasiv B.V., Fabrieksweg 4 7451 EM Holten Netherlands
- Kuhmichel Abrasiv GmbH, Am Rosenbaum 22 40682 Ratingen Germany
- Kuhmichel Abrasiv Ltd., Friars Mill, Friars Terrace ST17 4AU Stafford United Kingdom
- Kuhmichel Recycling GmbH, Ermslebener Straße 3 06493 Ballenstedt Germany
- KVS EKODIVIZE a.s., Leskovska 566 79312 Horni Benesov Czech Republic
- LKAB Minerals Ltd, Flixborough Industrial Estate Third Avenue DN15 8SF Flixborough North Lincolnshire United Kingdom
- LTS-REACH-OR-NANOPHASE, 43-45 rue Jaroque 33500 sainte eulalie France
- LUGLI SRL, Via Valmanella, 14 14040 Castelnuovo Calcea Piemonte Italy
- MARTINSWERK GMBH, Koelnerstrasse, 110 50127 BERGHEIM Germany
- Merck KGaA, Frankfurter Strasse 64293 Darmstadt Germany
- Micro Abrasives Europe GmbH, Schweriner Strasse 13 22844 Norderstedt Germany
- MIDEGASA SA, INDUSTRIALDEA ASTEASU, NAVES 102-103 20159 ASTEASU GIPUZKOA Spain
- MINERALS GmbH & Co. KG, Alfredstr. 61 45130 Essen Germany
- MINERMET SPA, Via Durini 27 20122 Milano Italy
- MINMETALS GERMANY GMBH, Kaiserswerther Straße 22 40477 Düsseldorf Germany
- Morgan Advanced Ceramics Wesgo GmbH, Willi-Grasser-Str. 11 D-91056 Erlangen Germany
- MOTIM Electroconundum Ltd., Timföldgyári utca 9-13 9200 Mosonmagyaróvár Hungary
- MP Biomedicals Germany GmbH, Thüringer Straße 15 37269 Eschwege Germany
- Nabaltec AG, Alustr. 50-52 92421 Schwanau Germany
- Nemoto Portugal - Quimica Fina, Lda., Pg. Ind. Manuel da Mota, Lote 1E 3100-354 Pombal Portugal
- Neue Porzellanfabrik Triptis GmbH, Geraer Strasse 51 07819 Triptis Germany
- Nickelhütte Aue GmbH, Rudolf-Breitscheid-Straße 65-75 D-08280 Aue Germany
- Noble Resources UK Limited, 33 Cavendish Square W1G 0PW London United Kingdom
- Normag GmbH, Saalburgstr. 155 61350 Bad Homburg Germany
- Norðurá Century Aluminium, Grundartanga 301 Akranes Iceland
- Oerlikon Metco Europe GmbH, Spreestrasse 2 65451 Kelsterbach Hessen Germany
- Oerlikon Metco WOKA GmbH, Im Vorwerk 25 36456 Barchfeld-Immelborn Germany
- officina dell'ambiente, strada provinciale 193/bis 27034 lomello Italy
- PETROCHINA INTERNATIONAL (LONDON) CO., LTD, 5 Wilton Road SW1V 1AN LONDON United Kingdom
- Pferd Rüggeberg, S.A., Jundiz 18 (Pol. Ind. Jundiz) 01015 Vitoria-Gasteiz Spain
- Pilmex S.r.l., Via Campo d' Appio n°144 54031 Avenza Italy
- Possehl Erzkontor GmbH & Co. KG, Beckergrube 38-52 23552 Lübeck Germany
- Q.S.Abrasivi Marengo SRL, via delle Ghilare SS 35 bis del Giovi 15062 Bosco Marengo Italy
- Quarzwurke GmbH, Kaskadenweg 40 50226 Frechen Germany
- Rappold Winterthur Technologie GmbH, Sankt Magdalener Strasse 85 9500 Villach Austria
- REACH GLOBAL SERVICES S.A., Rond Point Schuman, 6 Box 5 B-1040 Brussels Belgium
- REACH24H CONSULTING GROUP, Paramount Court, Corrigan Road, Sandford Dublin 18 Dublin Ireland
- REACH24H CONSULTING GROUP, Paramount Court, Corrigan Road, Sandford Dublin 18 Dublin Ireland
- REACH24H CONSULTING GROUP, Suite 1E, Paramount Court, Corrigan Road, Sandford Dublin 18 Dublin Ireland
- REACH24H CONSULTING GROUP (Shaanxi king stone enterprise company limited), Suite 1E, Paramount Court, Corrigan Road, Sandford Dublin 18 Dublin Ireland
- REACHLaw Ltd., Vänrikinkuja 3 JK 21 FI-02600 Espoo Finland
- Refractaria, S.A., Buenavista, 13 33187 Siero Asturias Spain
- RHI Urmitz AG & Co. KG, Gewerbe und Industriegebiet Urmitz/Bshnhof 55220 Mühlheim-Kärlich Urmitz Germany
- RHODIA OPERATIONS, 40 rue de la Haie Coq 93306 AUBERVILLIERS France
- RHODIUS Schleifwerkzeuge GmbH & Co. KG, Brothalstr. 2 56659 Burgbrohl Germany
- Richard Baker Harrison Ltd., Marsh Trees House Marsh Parade ST5 1BT Newcastle-under-Lyme Staffordshire United Kingdom
- Rivendell International, Rivendell House Co. Meath Stamullen Ireland
- Rivendell International, Rivendell House Co. Meath Stamullen Co. Meath Ireland
- RSA le Rubis SA, RN85 38560 JARRIE France
- Rusal Aughinish Alumina, Aughinish Island 0000 Askeaton County Limerick Ireland
- SAINT-GOBAIN ABRASIFS FRANCE, RUE DE L'AMBASSADEUR BP 8 78702 CONFLANS-SAINT-HONORINE France
- SAINT-GOBAIN ABRASIVES BV (NEDERLAND), GROENLOSEWEG P.O. BOX 10 7150 EIBERGEN Netherlands
- SAINT-GOBAIN ABRASIVES LIMITED, DOXEY ROAD ST161EA STAFFORD United Kingdom
- SAINT-GOBAIN ABRASIVES SP Z.O.O., 239 - 241 UL.TORUNSKA VOIVIDIE WIELKOPOLSKIE 62600 KOLO Poland
- SAINT-GOBAIN ABRASIVI SPA, 4 VIA PER CESANO BOSCONI 20094 CORSICO Italy
- Saint-Gobain Ceramic Materials GMBH, AM BAHNOF D-56414 Steinefrenz Germany
- Saint-Gobain Coating Solutions, 50 RUE DU MOURELET B.P. 90966 84093 Avignon France
- Saint-Gobain Matériaux Céramiques, 17 rue de l'Artisanat ZI du Luteau 45 320 COURTENAY France
- Sait Abrasivi S.p.A., Via Torino Pianeza 20 10093 Collegno (TO) Italy
- Sasol Germany GmbH, Anckelmannsplatz 1 D-20537 Hamburg Germany
- Sasol Germany GmbH - OR, Anckelmannsplatz 1 D-20537 Hamburg Germany
- SC Alum SA, Isacsei 820228 Tulcea Tulcea Romania
- SCAS Europe S.A./N.V., Leonardo Da Vinciiaan 19 B-1831 Diegem Belgium
- SDCmaterials GmbH, Schipkauer Straße 1 01987 Schwarzhilde Germany
- SEPR, BP 60025 Route de Lyon 84131 le pontet cedex France
- SHOWA DENKO EUROPE GmbH, KONRAD-ZUSE-PLATZ 3 81829 München Germany
- SHOWA DENKO EUROPE GmbH (STIC), Konrad-Zuse-Platz 3 81829 Munich Germany
- SILKEM, d.o.o., Tovarniška cesta 10 2325 Kidričevo Slovenia Slovenia
- Simex Lochaber Hydropower 2 Limited, 7 Hartford Street W1J 7RH London United Kingdom
- Sinopac Europa GmbH, Messe Turm Friedrich-Ebert-Anlage 49 60308 Frankfurt am Main Germany
- SSAIL - OR for BAWPL, 8th Floor Neathouse Place SW1V1LH London United Kingdom
- SSAIL - OR for BMSA, 8th Floor Neathouse Place SW1V1LH London United Kingdom
- Starcke GmbH & Co. KG, Markt 10 49324 Melle Germany
- StonCor Europe, Rue du Travail, 9 1400 Nivelles Belgium
- SWATYCOMET d.o.o., Tkova cesta 60 SI-2000 Maribor - Slovenia
- Sør-Norge Aluminium AS, Onarheimsvæien 54 5460 Husnes Norway
- TALUM d.d., Tovarniška 10 2325 KIDRIČEVO Slovenia
- The Bergquist Company GmbH, Verbindungsweg 42 25469 Halstenbek Germany
- thyssenkrupp Raw Materials, thyssenkrupp Allee 1 45143 Essen NRW Germany
- TQSOH EUROPE B.V., Hullenbergweg 359 1101 CP Amsterdam Netherlands
- Traxys Europe SA, 19-21 Route Arlon same L-8009 Strassen Luxembourg Luxembourg
- TRAXYS France S.A.S., 49 avenue Hoche 75008 Paris France
- TRB, 7 rue de la neuville 62152 nesles France
- Treibacher Schleifmittel Villach\_OR\_TSK, Seebach 2 9523 Landskron Villach Austria
- Treibacher Schleifmittel Villach\_OR\_TSK, Seebach 2 9523 Landskron Villach Austria
- TRIMET Aluminium SE, Aluminiumallee 1 45356 Essen NRW Germany
- TRIMET FRANCE, Rue Henri Sainte Claire Deville Zone Industrielle Le Parquet 73300 SAINT JEAN DE MAURIENNE France
- TSGE, Concordia House, St James Business Park Grimbald Crag Court HG5 8QB Knaresborough North Yorkshire United Kingdom
- TÜV SÜD Industrie Service GmbH, IS-USR-MUC Westendstraße 199 80686 Munich Germany
- Umicore NV/SA, Rue du Marais 31 1000 Brussels Belgium
- United Company Rusal Aluminium Limited, Themistokli Dervis Street, 5 Elenion Building, 2nd floor 1066 Nikosia Cyprus
- United Company Rusal Aluminium Limited, Themistokli Dervis Street, 5 Elenion Building, 2nd floor 1066 Nikosia Cyprus
- Univar BV, Schouwburgplein 30-34 NL-3012 CL Rotterdam Netherlands
- UOP B.V.B.A., Noorderlaan 147 B-2030 Antwerp Belgium
- Veitsch-Radex GmbH & Co OG, Wienerbergstrasse 11 1100 Wien Austria
- Vesuvius France S.A., 68, Rue Paul Deudon 59750 Feignies France
- Vesuvius Poland Sp. z o.o., ul. Tyniecka 12 32-050 Skawina Poland
- Vesuvius UK Ltd, 1 Midland Way Central Park 843 4XA Batiborough Links Derbyshire United Kingdom
- VSM - Vereinigte Schmirgel- und Maschinen-Fabriken AG, Siegmundstr. 17 30165 Hannover Germany
- washington mills electro minerals limited, mosley road trafford park m17 1nr manchester lancashire United Kingdom
- Wester Mineralien GmbH, Heerstrasse 41 53347 Alfth - Witterschlick NRW Germany
- William Blythe Limited, Bridge Street BB5 4PD Church / Accrington Lancashire United Kingdom
- [Confidential], [Confidential]

#### Inactive

- BHP Billiton Marketing B.V., Verheeskade 25 2521 BE Den Haag Netherlands
- Chemical Inspection & Regulation Service Limited, Singleton House, Laurence Street Co. Louth Drogheda Ireland
- Kavneer Nederland B.V (OR Alcoa Minerals of Jamaica), Archimedesstraat 9, 3846 CT Harderwijk Netherlands

## Other names

### IUPAC names

- .
- 13547\_1344-28-1
- Activated Alumina
- Activated alumina / catalyst support
- Al2O3
- Alomax N8
- Alumina
- Alumina (Actal-UG1)
- Aluminas
- ALUMINIUM OXIDE
- Aluminium oxide (Brown Fused Alumina)
- ALUMINIUM OXIDE (ENCAPSULATED)
- aluminium oxide equivalent
- Aluminium oxide, activated alumina, calcined alumina, fused alumina, tabular alumina, fused alumina
- Aluminium oxide, Alumina
- aluminium sesquioxide
- Aluminium(III)oxide
- Aluminiumoxide
- Aluminium (III) oxide
- Aluminium Oxide
- Aluminium oxide, alumina
- Brown fused alumina
- Brown Fused Alumina (BFA)
- Dialuminium trioxide
- dialuminium oxygen
- dialuminium oxygen(2-) hydrate
- dialuminium; oxygen(2-)
- dialuminium;oxygen(2-)
- Fused Alumina
- Fused Aluminium Oxide
- Korund
- Nafen
- Not available
- oxid hlinitý
- oxo(oxoalumanyloxy)alumane
- Oxo(oxoalumanyloxy)alumane
- oxo(oxoalumanyloxy)alumane
- oxo[(oxoalumanyloxy)alumane
- Tabular alumina
- White fused alumina
- White Fused Alumina, Calcined alumina, Tabular alumina and Fused alumina
- White Fused Alumina, Electrocorundum, Korund
- xo(oxoalumanyloxy)alumane

### Regulatory processes names

- Aluminium oxide

#### Trade names

- A
- AB 12
- AB75
- Actal-UG1
- Activated Alumina
- Adamas® A-100D Alumina Powder
- Adamas® A-901K Splendor White
- Adamas® AE-901K-OP Splendor White
- Aeroxide
- Alcaten
- ALO-Marron
- ALO-.....
- Alu - Oxide, Alu - Oxid, Sandy Calcined, Metallurgical Grade Alumina, Sandy Calcined Alumina, Sandy Alumina
- Alugel
- Alumac
- Alumax
- Alumina
- ALUMINA CALCINADA
- ALUMINA CALCINADA 9 GRADE
- ALUMINA CALCINADA BM45 GRADE
- ALUMINA CALCINADA G GRADE
- ALUMINA CALCINADA HTM1
- ALUMINA CALCINADA S
- ALUMINA CALCINADA STANDARD
- ALUMINA MICRONIZADA HTM10
- ALUMINA MICRONIZADA HTM20
- ALUMINA SX
- Alumina, fused alumina, fumed alumina, activated alumina, tabular alumina
- Alumina, fused alumina, fumed alumina, activated alumina, tabular alumina, Aluminium Oxide, Aluminium Oxid,
- Alumina, fused alumina, fumed alumina, activated alumina, tabular alumina, Aluminium Oxide, Aluminium Oxid, Alu - Oxide, Alu - Oxid, Sandy Calcined, Metallurgical Grade Alumina, Sandy Calcined Alumina, Sandy Alumina, Calcined Alumina
- Alumina
- ALUMINIUM OXIDE
- Aluminium Oxide, Aluminium Oxid, Alu - Oxide, Alu - Oxid, Sandy Calcined Metallurgical Grade Alumina, Sandy Calcined Alumina, Sandy Alumina Calcined
- Alumina, Smelter Grade Alumina, Smelting Grade Alumina, Metallurgical Grade Alumina
- Aluminium oxide
- Aluminium Oxide Powder
- Alumium Oxide
- Alutab
- B Class Alumina
- BCF
- BFA
- BLACK ALUMINUM
- Black Fused Alumina
- BROWN /WHITE ALUMINIUM OXIDE ( FUSED ALUMINA )
- Brown corundum
- BROWN FUSED ALUMINA
- Brown Fused Alumina (BFA)
- Brown Fused Alumina
- Brown Fused Aluminium
- Brown fused aluminium oxide
- Brown Fused Aluminium Oxide
- BRWON FUSED ALUMINA OXIDE
- BZ
- Calcined Alumina
- Calcined alumina GKE
- Calcined alumina GKM
- Calcined alumina GKT
- Calcined Alumina, Smelter Grade Alumina, Smelting Grade Alumina Metallurgical Grade Alumina, Alumar Alumina
- Catalox
- Ceralox
- Chlorocel
- COMPALOX®
- CORINDON AMAX BLANC
- CORINDON AMAXICOR BLANC
- CORINDON BLANC
- Corindón
- Corindón blanco
- Corindón marrón
- Corundum
- CS-331 carrier types
- CTR carrier
- D10-10
- Dispal R 14N4-80 Alumina
- DMPJ
- Dryocel
- Durocel
- Dynocel
- EDR
- EK
- EK8A
- FESITI
- Fluorocel
- FO
- FR
- Fumed alumina
- FUSED ALUMINA
- Fused Alumina
- Fused aluminium oxide
- Fused Aluminium oxide (Corundum)
- FWA
- Hydrocel
- In pure form: TK-xx
- KKD
- KKW
- MARTIPOL®
- MARTOXID®
- MARTOXIN®
- Maxcel
- Microcrystalline Ceramic Abrasives
- Mirinae® A-1000D Alumina Powder
- Monocrystalline Fused Alumina
- Nabalox
- Normalkorund
- OPL
- OSO
- PC
- Peroxcel
- PINK FUSED ALUMINA
- Pink Fused Aluminium Oxide
- Polycel
- Puralox
- RB
- RB, Corindone Rosso-bruno
- RBT9
- Reactive alumina
- Reactive Alumina
- RG
- Rod
- Ruby Fused Alumina
- SA
- SCT
- SE































- SE250
- Semifirabile Fused Alumina
- SGA, SC-1, SC-13, SC-0, ESPD or alumina dust
- Siralox
- Smelter Grade Alumina, Smelting Grade Alumina Metallurgical Grade Alumina, Worsley alumina
- SO200
- Spectra® Optic White SP-9001M
- Spent activated alumina
- SRSK
- SynDol
- Tabular Alumina
- Tabular alumina ALFA TAB
- Tabular oxide
- Tengda
- The substance is placed on the market both as a substance in pure form and as a part of the chemical matrix of an inorganic catalyst (i.e. regarded as a preparation according to Guidance on substance identification).
- Tradename for the substance when constituting a part of the catalyst, see section 3.4 for tradenames on mixtures containing the substance
- Treibacher Alodur
- WA
- WFA
- WFA, White fused alumina
- White corundum
- White Fused Alumin
- WHITE FUSED ALUMINA
- White Fused Alumina (WFA)
- White Fused Alumina
- White fused aluminium oxide
- White Fused Aluminium Oxide
- WRG
- WSK
- ZIRCONIA ALUMINA
- ZPSK
- ZR

Other names

## Scientific properties




### Physical and chemical properties

This section provides physicochemical information compiled from all automatically processable data from REACH registration dossiers that is available to ECHA at the time of generation. The quality and correctness of the information remains the responsibility of the data submitter. The Agency thus cannot guarantee the correctness of the information displayed.




Appearance/physical state / colour				
Study results	4 studies submitted 0 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
△ No automatically processable data submitted		Studies with data     Weight of evidence 4	Data waiving  No data available no waivers	
Melting/freezing point				
Study results	14 studies submitted 4 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
 Melting / freezing point 1 200 - 2 054 °C [6]		Studies with data     Weight of evidence 14	Data waiving  No data available no waivers	
Boiling point				
Study results	12 studies submitted 4 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
 Boiling point 2 977 °C [4]		Studies with data     Weight of evidence 12	Data waiving  No data available no waivers	
Density				
Study results	16 studies submitted 4 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
 Relative density 3.5 - 4 [4]		Studies with data     Weight of evidence 15	Data waiving  No data available no waivers	
Vapour pressure				
Study results	8 studies submitted 0 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
△ No automatically processable data submitted		Studies with data     Weight of evidence 8	Data waiving  No data available no waivers	

<b>Partition coefficient</b>		<b>Type of Study provided</b>		<b>Summaries</b>	<b>0 summaries submitted</b> <b>0 summaries processed</b>
<b>Study results</b>	<b>2 studies submitted</b> <b>0 studies processed</b>				
⚠ No automatically processable data submitted		<b>Studies with data</b>	<div><div>⚠</div><div></div><div></div><div></div></div>	<b>Data waiving</b> Other	⚠ No data available
				2	
<b>Water solubility</b>		<b>Type of Study provided</b>		<b>Summaries</b>	<b>0 summaries submitted</b> <b>0 summaries processed</b>
<b>Study results</b>	<b>12 studies submitted</b> <b>2 studies processed</b>				
<div><div></div><b>Water solubility (mass/vol.)</b> 20 µg/L @ 20 °C and pH 6-7 [2]</div>		<b>Studies with data</b>	<div><div>⚠</div><div></div><div></div><div></div><div>⚠</div></div>	<b>Data waiving</b> no waivers	⚠ No data available
		<b>Key study</b>	2		
		<b>Weight of evidence</b>	10		
<b>Solubility in organic solvents / fat solubility</b>					⚠ Data not provided by the registrant
<b>Surface tension</b>		<b>Type of Study provided</b>		<b>Summaries</b>	<b>0 summaries submitted</b> <b>0 summaries processed</b>
<b>Study results</b>	<b>2 studies submitted</b> <b>0 studies processed</b>				
⚠ No automatically processable data submitted		<b>Studies with data</b>	<div><div>⚠</div><div></div><div></div><div></div><div>⚠</div></div>	<b>Data waiving</b> Other	⚠ No data available
				2	
<b>Flash point</b>		<b>Type of Study provided</b>		<b>Summaries</b>	<b>0 summaries submitted</b> <b>0 summaries processed</b>
<b>Study results</b>	<b>2 studies submitted</b> <b>0 studies processed</b>				
⚠ No automatically processable data submitted		<b>Studies with data</b>	<div><div>⚠</div><div></div><div></div><div></div><div>⚠</div></div>	<b>Data waiving</b> Sci. unjustified	⚠ No data available
				2	
<b>Auto flammability</b>		<b>Type of Study provided</b>		<b>Summaries</b>	<b>0 summaries submitted</b> <b>0 summaries processed</b>
<b>Study results</b>	<b>2 studies submitted</b> <b>0 studies processed</b>				
⚠ No automatically processable data submitted		<b>Studies with data</b>	<div><div>⚠</div><div></div><div></div><div></div><div>⚠</div></div>	<b>Data waiving</b> Sci. unjustified	⚠ No data available
				2	
<b>Flammability</b>		<b>Type of Study provided</b>		<b>Summaries</b>	<b>0 summaries submitted</b> <b>0 summaries processed</b>
<b>Study results</b>	<b>2 studies submitted</b> <b>0 studies processed</b>				
⚠ No automatically processable data submitted		<b>Studies with data</b>	<div><div>⚠</div><div></div><div></div><div></div><div>⚠</div></div>	<b>Data waiving</b> Sci. unjustified	⚠ No data available
				2	
<b>Explosiveness</b>		<b>Type of Study provided</b>		<b>Summaries</b>	<b>0 summaries submitted</b> <b>0 summaries processed</b>
<b>Study results</b>	<b>2 studies submitted</b> <b>0 studies processed</b>				
⚠ No automatically processable data submitted		<b>Studies with data</b>	<div><div>⚠</div><div></div><div></div><div></div><div>⚠</div></div>	<b>Data waiving</b> Sci. unjustified	⚠ No data available
				2	
<b>Oxidising</b>		<b>Type of Study provided</b>		<b>Summaries</b>	<b>0 summaries submitted</b> <b>0 summaries processed</b>
<b>Study results</b>	<b>2 studies submitted</b> <b>0 studies processed</b>				
⚠ No automatically processable data submitted		<b>Studies with data</b>	<div><div>⚠</div><div></div><div></div><div></div><div>⚠</div></div>	<b>Data waiving</b> Sci. unjustified	⚠ No data available
				2	
<b>Oxidation reduction potential</b>					⚠ Data not provided by the registrant
<b>pH</b>					⚠ Data not provided by the registrant

## Dissociation constant

Study results	2 studies submitted 0 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
⚠ No automatically processable data submitted		<b>Studies with data</b>   	<b>Data waiving</b> Sci. unjustified 2	⚠ No data available

## Viscosity

Study results	2 studies submitted 0 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
⚠ No automatically processable data submitted		<b>Studies with data</b>   	<b>Data waiving</b> Sci. unjustified 2	⚠ No data available




## Environmental fate and pathways

This section provides environmental fate and pathways information compiled from all automatically processable data from REACH registration dossiers that is available to ECHA at the time of generation. The quality and correctness of the information remains the responsibility of the data submitter. The Agency thus cannot guarantee the correctness of the information displayed.

### Phototransformation in air

⚠ Data not provided by the registrant

### Hydrolysis

Study results	2 studies submitted 0 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
⚠ Study data not processed for final profile		<b>Studies with data</b>   	<b>Data waiving</b> Sci. unjustified 2	⚠ No data available




### Phototransformation in water

⚠ Data not provided by the registrant

### Phototransformation in soil

⚠ Data not provided by the registrant




### Biodegradation in water - screening tests

Study results	2 studies submitted 0 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
⚠ No automatically processable data submitted		<b>Studies with data</b>   	<b>Data waiving</b> Sci. unjustified 2	⚠ No data available




### Biodegradation in water & sediment - simulation tests

⚠ Data not provided by the registrant

### Biodegradation in soil

Study results	2 studies submitted 0 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
⚠ Study data not processed for final profile		<b>Studies with data</b>   	<b>Data waiving</b> Sci. unjustified 2	⚠ No data available




### Bioaccumulation: aquatic / sediment

Study results	2 studies submitted 0 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
⚠ Study data not processed for final profile		<b>Studies with data</b>   	<b>Data waiving</b> Exposure cons. 2	⚠ No data available

### Bioaccumulation: terrestrial

⚠ Data not provided by the registrant

### Adsorption/desorption

Study results	2 studies submitted 0 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
⚠ No automatically processable data submitted		<b>Studies with data</b>   	<b>Data waiving</b> Sci. unjustified 2	⚠ No data available

Study results	2 studies submitted 0 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
No automatically processable data submitted		Studies with data	Data waiving Sci. unjustified	No data available
			2	

<b>Study results</b> 2 studies submitted 0 studies processed	<b>Type of Study provided</b> No summary exists for this scientific endpoint
<b>Studies with data</b> <div> </div>	<b>Data waiving</b> Sci. unjustified 2

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**R** Summaries 3 summaries submitted  
3 summaries processed

The Predicted No-Effect Concentration (PNEC) value is the concentration of a substance below which adverse effects in the environment are not expected to occur. Please note that when more than one summary is provided, PNEC values may refer to constituents of the substance and not to the substance as a whole. More detailed information is available in the dossiers.

Hazard for Aquatic Organisms		Hazard for Air	
Freshwater	No data: aquatic toxicity unlikely (2)	Air	No hazard identified (1)
Marine water	No data: aquatic toxicity unlikely (2)	Hazard for Terrestrial Organism	
Intermittent releases (freshwater)	No data: aquatic toxicity unlikely (2)	Soil	No or insufficient data available at present (3)
Sewage treatment plant (STP)	20 mg/L (2)	Hazard for Predators	
Sediment (freshwater)	No or insufficient data available at present (3)	Secondary poisoning	No or insufficient data available at present (3)
Sediment (marine water)	No or insufficient data available at present (3)		

Study results	51 studies submitted 42 studies processed	Type of Study provided	Summary 3	9 summaries submitted 6 summaries processed
P/R	Results	Studies with data	Data waiving	No data available
LC50 (16 days)	430 - 3 910 µg/L [12]		no waivers	
LC50 (8 days)	22.4 mg/L [3]	34	8	
LC50 (4 days)	78 - 218 644.1 µg/L [62]			
LC50 (4 days)	2.9 µmol/L [1]			
LC50 (72 h)	10 - 19.3 mg/L [6]	3	6	

Study results	36 studies submitted 30 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
<p><b>[P/R] Results</b></p> <p>NOEC (60 days) 88 - 350 µg/L [12]</p> <p>NOEC (33 days) 71.5 - 558.1 µg/L [7]</p> <p>NOEC (30 days) 57 - 88 µg/L [9]</p> <p>NOEC (28 days) 4.7 - 23.1 mg/L [12]</p> <p>NOEC (7 days) 25.1 - 56 480 µg/L [41]</p>		<p>Studies with data</p> <p>Weight of evidence</p> <p>Other</p>	<p>Data waiving</p> <p>no waivers</p> <p>△ No data available</p>	

Study results	39 studies submitted 36 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
<p><b>P/R</b> Results</p> <p>EC50 (48 h) 1.5 - 2.56 mg/L [9]</p> <p>LC50 (4 days) 22 - 30.6 mg/L [6]</p> <p>LC50 (48 h) 5.7 - 99 600 µg/L [51]</p> <p>NOEC (4 days) 22.6 mg/L [3]</p> <p>NOEC (48 h) 5 - 672 µg/L [21]</p>		<p>Studies with data</p> <p>Weight of evidence</p> <p>Other</p>	<p><b>Data waiving</b></p> <p>no waivers</p>	<p><b>No data available</b></p>

# Long-term toxicity to aquatic invertebrates

Study results	42 studies submitted 36 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
<div> <div>P/R</div> <div>Results</div> </div> <div> NOEC (42 days) 232.6 - 453.8 µg/L [4]  NOEC (30 days) 1.092 - 2.099 mg/L [2]  NOEC (28 days) 53.1 - 4 281.8 µg/L [7]  NOEC (21 days) 76 - 600 µg/L [7]  NOEC (17 days) 962.5 µg/L [1] </div>				
Studies with data		<div> <div>▲</div> <div>□</div> <div>□</div> <div>□</div> <div>▲</div> </div>	Data waiving	▲ No data available
Weight of evidence		34	no waivers	
Other		2	4	

# Toxicity to aquatic algae and cyanobacteria

Study results	30 studies submitted 30 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
<div> <div>P/R</div> <div>Results</div> </div> <div> EC50 (4 days) 5.4 - 570 µg/L [15]  EC50 (72 h) 16.9 - 4 980 µg/L [69]  NOEC (72 h) 4 - 600 µg/L [25]  LOEC (72 h) 400 - 1 000 µg/L [10]  EC10 (72 h) 203 - 3 155 000 ng/L [69] </div>				
Studies with data		<div> <div>▲</div> <div>□</div> <div>□</div> <div>□</div> <div>▲</div> </div>	Data waiving	▲ No data available
Weight of evidence		30	no waivers	

# Toxicity to aquatic plants other than algae

Study results	4 studies submitted 4 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
<div> <div>P/R</div> <div>Results</div> </div> <div> EC50 (7 days) 8.643 - 15.966 mg/L [3]  NOEC (7 days) 2.76 mg/L [3]  NOEC (4 days) 45.7 mg/L [3]  LOEC (7 days) 5.314 mg/L [3]  EC10 (7 days) 2.175 - 4.545 mg/L [3] </div>				
Studies with data		<div> <div>▲</div> <div>□</div> <div>□</div> <div>□</div> <div>▲</div> </div>	Data waiving	▲ No data available
Weight of evidence		4	no waivers	

# Toxicity to microorganisms

Study results	2 studies submitted 0 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
<div> <div>▲</div> <div>No automatically processable data submitted</div> </div>				
Studies with data		<div> <div>▲</div> <div>□</div> <div>□</div> <div>□</div> <div>▲</div> </div>	Data waiving	▲ No data available
			Sci. unjustified	2

# Sediment toxicity

Study results	2 studies submitted 0 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
<div> <div>▲</div> <div>No automatically processable data submitted</div> </div>				
Studies with data		<div> <div>▲</div> <div>□</div> <div>□</div> <div>□</div> <div>▲</div> </div>	Data waiving	▲ No data available
			Sci. unjustified	2

# Toxicity to terrestrial macroorganisms except arthropods

Study results	2 studies submitted 0 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
<div> <div>▲</div> <div>No automatically processable data submitted</div> </div>				
Studies with data		<div> <div>▲</div> <div>□</div> <div>□</div> <div>□</div> <div>▲</div> </div>	Data waiving	▲ No data available
			Sci. unjustified	2

# Toxicity to terrestrial arthropods

Study results	2 studies submitted 0 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
<div> <div>▲</div> <div>No automatically processable data submitted</div> </div>				
Studies with data		<div> <div>▲</div> <div>□</div> <div>□</div> <div>□</div> <div>▲</div> </div>	Data waiving	▲ No data available
			Sci. unjustified	2

# Toxicity to terrestrial plants

Study results	2 studies submitted 0 studies processed	Type of Study provided	Summaries	0 summaries submitted 0 summaries processed
<div> <div>▲</div> <div>No automatically processable data submitted</div> </div>				
Studies with data		<div> <div>▲</div> <div>□</div> <div>□</div> <div>□</div> <div>▲</div> </div>	Data waiving	▲ No data available
			Sci. unjustified	2

### Toxicity to soil microorganisms

Study results	2 studies submitted (1 series processed)	Type of Study provided	Summaries	1 manuscript submitted (1 manuscript processed)
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▲ Not automatically processable if its submitted

Studies with data	Data waiving	No data available
1	1	1
2	2	2
3	3	3
4	4	4
5	5	5
6	6	6
7	7	7
8	8	8
9	9	9
10	10	10
11	11	11
12	12	12
13	13	13
14	14	14
15	15	15
16	16	16
17	17	17
18	18	18
19	19	19
20	20	20
21	21	21
22	22	22
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26	26	26
27	27	27
28	28	28
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92	92	92
93	93	93
94	94	94
95	95	95
96	96	96
97	97	97
98	98	98
99	99	99
100	100	100

### Toxicity to birds

Study results	2 studies submitted 0 studies processed	Type of Study provided	Summaries 0 summaries submitted 0 summaries processed
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⚠ Non-rationally processable data omitted

Studies with data		Data waiving	No data available
		Sci. unjustified	2

### Toxicity to mammals

Study status	Type of Study provided	Submitted	Accepted for publication
2 studies submitted	0 studies provided	0 studies submitted	0 studies accepted for publication

Δ: Not automatically processable data submitted

<b>Studies with data</b>	   	<b>Data waiving</b> <small>DATA NOT FOR PUBLICATION</small>	<b>No data available</b>
<small>CONSIDERED A HIGH RISK CATEGORY OF STUDIES BASED ON THE FOLLOWING CRITERIA:</small>		<b>Sci. unjustified</b>	<b>2</b>

### Toxicological information

This section provides toxicological information compiled from all automatically processable data from REACH registration dossiers that is available to ECHA at the time of generation. The quality and correctness of the information remains the responsibility of the data submitter. The Agency thus cannot guarantee the correctness of the information displayed.

## Derived No- or Minimal Effect Level (DN(M)EL)


**M/C** Summaries
 
 2 summaries submitted  
 2 summaries processed

The derived no- or minimum effect level (DN(M)EL) is the level of exposure above which a human should not be exposed to a substance. Please note that when more than one summary is provided, DN(M)EL values may refer to constituents of the substance and not to the substance as a whole. More detailed information is available in the dossiers.

### Data for WORKERS

INHALATION Exposure	Threshold	Most sensitive study
<b>Systemic Effects</b>		
Long-term:	(DNEL) 15.63 mg/m³	repeated dose toxicity
Acute /short term:	No hazard identified	

### Local Effects

Long-term: (DNEL) 15.63 mg/m<sup>3</sup> repeated dose toxicity

Acute /short term:

### DERMAL Exposure

Dermal Exposure		Inhalation	
100% (100 mg/kg bw/d)	100% (100 mg/kg bw/d)	100% (100 mg/kg bw/d)	100% (100 mg/kg bw/d)
<b>Systemic Effects</b>			
Long-term:	+	+	+
Acute/short term:	+	+	+

### Local Effects

Long-term:

Acute /short term:

### EYE Exposure

No hazard identified

#### Data for the GENERAL POPULATION

INHALATION Exposure	Threshold	Most sensitive study
<b>Systemic Effects</b>		
Long-term:	-	+
Acute /short term:	-	+

### Local Effects

Long-term:		Acute /short term:	
1	2	3	4

## DERMAL EXPOSURE

DERMAL Exposure	Inhalation	Oral Exposure
Systemic Effects		
Long-term:		
Acute /short term:		

### Local Effects

	Long-term:	*	*
	Acute /short term:	*	*

### ORAL Exposure

**Systemic Effects**

### Systemic Effects

Long-term:	(DNEL) 3.29 mg/kg bw/day	repeated dose toxicity
Acute /short term:	No hazard identified	

### EYE Exposure

**No hazard identified**



# Toxicokinetics, metabolism, and distribution

Study results

Type of Study provided

Summaries

0 summaries submitted  
0 summaries processed

Study data: basic toxicokinetics

⚠ No data available

⚠ Study data not processed for brief profile

Studies with data	⚠	📄	📊	📈	Data waiving
Key study	4			2	no waivers
Supporting study	4			1	
Other				1	

Study data: dermal absorption

⚠ Study data not processed for brief profile

Studies with data	⚠	📄	📊	📈	Data waiving
Key study				2	no waivers

## Acute toxicity

Study results

Type of Study provided

Summaries

0 summaries submitted  
0 summaries processed

oral 12 studies submitted  
6 studies processed

oral

⚠ No data available

**P/R** Results

LD50 10 000 - 15 900 mg/kg bw (rat) [6]

**M/C** Interpretations of results

Not classified [6]

Studies with data	⚠	📄	📊	📈	Data waiving
Key study	6				no waivers
Supporting study	4			2	

inhalation 7 studies submitted  
6 studies processed

inhalation

**P/R** Results

LC50 (4 h) 888 - 2 300 mg/m³ air (rat) [4]

LC50 (60 min) 7.6 mg/L air (rat) [2]

LC0 (4 h) 888 mg/m³ air (rat) [2]

**M/C** Interpretations of results

Not classified [6]

Studies with data	⚠	📄	📊	📈	Data waiving
Key study	4			2	no waivers
Supporting study				1	

dermal 2 studies submitted  
0 studies processed

dermal

⚠ No automatically processable data submitted

Studies with data	⚠	📄	📊	📈	Data waiving
					Sci. unjustified 2

other routes 0 studies submitted  
0 studies processed

other routes

⚠ No data available

Studies with data	⚠	📄	📊	📈	Data waiving
					no waivers

## Irritation / corrosion

Study results

Type of Study provided

Summaries

0 summaries submitted  
0 summaries processed

Study data: skin

⚠ No data available

⚠ Study data not processed for brief profile

Studies with data	⚠	📄	📊	📈	Data waiving
Key study	6				no waivers
Supporting study				3	
Other				1	

Study data: eye

⚠ Study data not processed for brief profile

Studies with data	⚠	📄	📊	📈	Data waiving
Key study	4				no waivers
Supporting study	3			3	

## Sensitisation

Study results

Type of Study provided

Summaries

0 summaries submitted  
0 summaries processed

Study data: skin

⚠ No data available

⚠ Study data not processed for brief profile

Studies with data	⚠	📄	📊	📈	Data waiving
Key study	2				no waivers
Supporting study				2	
Weight of evidence				2	

Study data: respiratory

⚠ Study data not processed for brief profile

Studies with data	⚠	📄	📊	📈	Data waiving
Weight of evidence	2				no waivers

## Repeated dose toxicity

Study results

Type of Study provided

Summaries

0 summaries submitted  
0 summaries processed

Study data: oral  
10 studies submitted  
10 studies processed

Study data: oral

⚠ No data available

**P/R** Results

rat (i): 888 mg/m<sup>3</sup> air [2]  
NOAEL (rat): 200 - 3 225 mg/kg bw/day [13]  
NOAEL (rat): 141 - 302 mg/kg diet [6]  
NOAEL (dog): 90 mg/kg diet [2]  
LOAEL (rat): 1 000 - 1 075 mg/kg bw/day [3]

Studies with data	⚠	📄	📊	📈	Data waiving
Weight of evidence				10	no waivers

Study data: inhalation  
12 studies submitted  
2 studies processed

Study data: inhalation

**P/R** Results

NOAEC (rat): 70 mg/m<sup>3</sup> air [2]

Studies with data	⚠	📄	📊	📈	Data waiving
Key study	2				no waivers
Supporting study	5			2	
Other	3				

Study data: dermal  
0 studies submitted  
0 studies processed

Study data: dermal

⚠ No data available

Studies with data	⚠	📄	📊	📈	Data waiving
					no waivers

## Genetic toxicity

Study results

Type of Study provided

Summaries

0 summaries submitted  
0 summaries processed

Study data not processed for brief profile

Study data: in vitro

No data available

Study data not processed for brief profile

Studies with data				
Weight of evidence				14
Other				4

Data waiving  
no waivers

Study data not processed for brief profile

Study data: in vitro

Study data not processed for brief profile

Studies with data				
Weight of evidence	8			2
Other				6

Data waiving  
no waivers

## Carcinogenicity

Study results

10 studies submitted  
0 studies processed

Type of Study provided

Summaries

0 summaries submitted  
0 summaries processed

Study data not processed for brief profile

Studies with data				
Weight of evidence	8			2

Data waiving  
no waivers

No data available

## Toxicity to reproduction

Study results

Type of Study provided

Summaries

0 summaries submitted  
0 summaries processed

Study data not processed for brief profile

Study data: reproduction

No data available

Study data not processed for brief profile

Studies with data				
Key study				4
Supporting study				2
Weight of evidence				2

Data waiving  
Sci. unjustified

2

Study data not processed for brief profile

Study data: developmental

Study data not processed for brief profile

Studies with data				
Key study				2
Supporting study				12
Other				2

Data waiving  
no waivers

Study data not processed for brief profile

Study data: other studies

Study data not processed for brief profile

Studies with data				
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Data waiving  
no waivers

## Neurotoxicity

Study results

12 studies submitted  
0 studies processed

Type of Study provided

Summaries

0 summaries submitted  
0 summaries processed

Study data not processed for brief profile

Studies with data				
Key study				2
Supporting study				8
Other				2

Data waiving  
no waivers

No data available

## Immunotoxicity

Data not provided by the registrant