

Section 1: Product and Company Identification:

1.1 Product Identifier

Product Form: Mixture
 Identification of Substance: Antimony Pentoxide (APO) in Polypropylene
 Product Name: BurnEx® 6215-60
 Synonym: None.
 CAS Number: 1314-60-9
 Index Number: 051-003-00-9
 EINECS Number: 215-237-7
 REACH Registration Number: 01-2119918494-33-0001
 Formula: Sb_2O_5

1.2 Relevant identified uses of the substance or mixture and uses advised against

Recommended Use: Recommended for use as a flame retardant.
 Restrictions on Use: For industrial use only, not for food, drug or home use.

1.3 Details of the supplier of the safety data sheet

Company Identification: Nyacol Nano Technologies, Incorporated
 Megunko Road, P.O. Box 349, Ashland, MA 01721 U.S.A.
 508-881-2220
 Email Contact: info@nyacol.com
 Internet: www.nyacol.com

1.4 Emergency telephone number

In Case of Emergency: CHEMTREC: 1-800-424-9300
 International CHEMTREC: +1 (703) 527-3887
 24 Hours/Day: 7 Days/Week

Section 2: Hazard(s) Identification

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

Serious eye damage: Category 1

Classification according to Regulation (EC) No. 1272/2008 (CLP)

H318 Causes serious eye damage.

2.2 Label Elements



Signal Word: Danger

Hazard determining components of labelling:

Alkyl amine, ethoxylated

Hazard Statement(s):

H318 Causes serious eye damage.

Precautionary Statement(s):

P280 – Wear protective gloves/protective clothing/eye protection/ face protection.
 P305+P351+P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P310 – Immediately call a POISON CENTER or doctor/physician.

2.3 Other Hazards

Antimony pentoxide does not meet the criteria for a PBT or vPvB substance.

2.4 Unknown acute toxicity (GHS US)

No further relevant information available.

Section 3: Composition / Information on Ingredients

3.1 Chemical characterization: Mixtures

Description: Mixture consisting of the following components.

Component Name:	Product Identifier	GHS Classification	Percent By Weight
Amines, tallow alkyl, ethoxylated: REACH: 05-2117294594-30-0000	CAS #: 61791-26-2 EC: 500-153-8 Index: Not available.	Acute Tox. 4, H302 Skin Irrit. 2 H315 Eye Dam. 1 H318 Aquatic Acute 1 H400	6
Polypropylene REACH: Not registered.	CAS #: 9003-07-0 EC: 618-352-4 Index: Not available.	Not classified	40
Antimony Pentoxide: REACH: 01-2119918494-33-0001	CAS #: 1314-60-9 EC: 215-237-7 Index: 051-003-00-9	Not classified	51
Water: REACH: None.	CAS #: 7732-18-5 EC: 231-791-2	Not classified	3

Impurities: Present at a level below that to be taken into account for classification.

Stabilizing Additives: None.
See Section 16 for a list of hazards if identified above.

Section 4: First-Aid Measures

4.1 Description of first aid measures

Eye Contact: Immediately flush eyes with large quantities of water for at least 15 minutes. Hold eyelids apart to ensure rinsing of the entire surface of the eye and lids with water. Get medical attention immediately.

Skin Contact: Wash with soap and plenty of water for at least 15 minutes. Wash contaminated clothing before reuse. If irritation occurs get medical attention.

Inhalation: Remove person from exposure source. Get medical attention.

Ingestion: If swallowed seek medical attention immediately. Rinse out mouth and then drink plenty of water. Never give anything by mouth to an unconscious person.

First Aid Facilities: Eye wash station

4.2 Most important symptoms and effects, both acute and delayed

No further relevant information available.

4.3 Indication of any immediate medical attention and special treatment needed.

Symptomatic treatment is recommended.

Section 5: Fire-Fighting Measures

5.1 Extinguishing Media

Suitable Extinguishing Media: All are acceptable. Cool containers with water spray.

Unsuitable extinguishing media: None known.

5.2 Special hazards arising from the substance or mixture

Flammability of the product: Product is not flammable.

Special Hazard Arising from the Chemical: Formation of toxic gases is possible during heating or in case of fire including carbon oxides and nitrogen oxides.

Fire Hazard: No further relevant information available.

Explosion Hazard: No further relevant information available.

Reactivity: No further relevant information available.

5.3 Advice for firefighters

Special Protective Equipment for Fire-fighters: Wear standard full firefighter turn-out gear (full bunker gear) and respiratory protection (SCBA).

Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1 For non-emergency personnel

Emergency responders should wear eye protection and impervious gloves. An approved air-purifying respirator should be worn if dust is present.

6.2 Environmental precautions

Stop source of spills. Do not release pellets into the environment.

6.3 Methods and material for containment and cleaning up

Prevent dust, cover spill if windy. Vacuum or shovel into containers for reuse or disposal. Ensure adequate ventilation.

6.4 Reference to other sections

For more information on exposure controls and personal protection or disposal considerations, check section 8 and 13 of this SDS.

Section 7: Handling and Storage

7.1 Precautions for safe handling

Avoid generating dust during use. Ensure good ventilation/ exhaustion at the workplace.

7.1.1 Protective measures

As a precautionary measure, the wearing of standard work gear is suggested.

7.1.2 Advice on general occupational hygiene

Avoid inhalation, ingestion, eye contact, and skin contact. General occupational hygiene measures are required to ensure a safe handling of the substance. These measures involve good personal and housekeeping practices (i.e. regular cleaning with suitable cleaning devices), no eating, drinking and smoking at the workplace and wearing standard working clothes and shoes unless otherwise stated. Wash hands after use. Remove contaminated clothing and protective equipment before entering eating areas. Shower and change clothes at end of work shift. Do not wear contaminated clothing at home.

7.2 Conditions for safe storage, including any incompatibilities

Store in cool, dry area and keep container tightly sealed. Provide sufficient ventilation at store- and workrooms.

7.3 Specific end use(s)

No additional information available. Refer to Section 1.2 of this SDS.

Section 8: Exposure Controls / Personal Protection

8.1 Control Parameters

8.1.1 National Limit Values

Antimony pentoxide (1314-60-9)

Country	Occupational exposure limit (as Sb)	Maximum exposure time	Date	Title	Reference
USA	0.5 mg/m ³ (as Sb)	8h TWA	2006	Antimony and compounds	https://www.osha.gov/dts/chemicalsampling/data/CH_219100.html
UK	0.5 mg/m ³ (as Sb)	8h TWA	2011	Antimony and compounds	Health and Safety Executive- http://www.hse.gov.uk/pubns/ priced/eh40.pdf
Germany	Not established		2009	Antimony and its inorganic compounds (inhalable fraction)	Senate Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area (MAK Commission): http://www.dfg.de/en/dfg_profile/statutory_bodies/senate/health_hazards/index.html
Finland	0.5 mg/m ³	8h TWA	2009	Antimony and its compounds	The Ministry of Social Affairs and Health- http://pre20090115.stm.fi/hm1113394626349/passthru.pdf
Belgium	0.5 mg/m ³ (as Sb)	8h TWA	2010	Antimony and its compounds	Service public fédéral Emploi, Travail et Concertation sociale: http://www.emploi.belgique.be/WorkArea/showcontent.aspx?id=23914
France	0.5 mg/m ³ (as Sb)	8h TWA	2012	Antimony and its compounds	Institut National de Recherche et de Sécurité - http://www.inrs.fr/accueil/produits/mediatheque/doc/publications.html?refINRS=ED%20984
Spain	0.5 mg/m ³ (as Sb)	8h TWA	2010	Antimony and antimony compounds	http://www.insht.es/InshtWeb/Contenidos/Documentacion/TextosOnline/Valores_Limite/Limites2010/LEP%202010%20ActualizadoMayo(1).pdf
Austria	0.5 mg/m ³ (as Sb)	8h TWA	2011	Antimony compounds	http://www.arbeitsinspektion.gv.at/NR/rdonlyres/F173280B-D4FB-44D2-8269-8DB2CB1D2078/0/GKV2011.pdf

8.1.2 PNECs and DNELs – Antimony Pentoxide (1314-60-9)

Descriptor	Route of Exposure/Environmental protection target	DNEL/PNEC
DNEL (Derived No Effect Level)		
	Inhalation – Long term/systemic effects	10 mg/m ³
PNEC (Predicted No Effect Concentration)		
	Freshwater	0.113 mg Sb/L
	Marine	0.0113 mg Sb/L
	Sediment freshwater	7.8 mg Sb/kg ww
	Sediment marine	1.56 mg Sb/kg ww

	Soil	37 mg Sb/kg dw (32.6 mg Sb/kg wwt)
	STP (Sewerage Treatment Plant)	2.55 mg Sb/L

8.2 Exposure Controls

8.2.1 Appropriate Engineering Controls

Use exhaust ventilation to keep airborne concentrations below exposure limits. Waste water generated during the production process or cleaning operations should be collected.

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

Hygiene Measures: Change contaminated clothing. Wash hands after working with substance.

Respiratory: When respiratory protection is required, or concentrations unknown, use approved air-purifying respirator with a dust cartridge.

Hands: Wear impervious gloves such as neoprene.

Eyes: Wear approved safety glasses.

Skin: Wear clean body-covering clothing; impervious gloves such as neoprene.
 Workers should wash exposed skin several times daily with soap and water.
 Soiled work clothing should be laundered or dry-cleaned.

8.2.3 Environmental Exposure Controls

The product should be recycled when possible. Appropriate controls should be put in place to prevent release of the product to the environment, including sewage systems, environment and water bodies.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Appearance (Physical State, Color):	Solid. White plastic pellets.
Upper/lower flammability or explosive limits:	Not determined.
Volatile by Weight:	Not determined.
Odor:	Odorless.
Vapor Pressure:	Not determined.
Odor Threshold:	Not determined.
Vapor Density:	Not determined.
pH:	Not applicable.
Density:	Not determined.
Melting Point:	Not determined.
Solubility in Water:	Not determined.
Initial boiling point and boiling range:	Not determined.
Flashpoint:	Not determined.
Evaporation Rate:	Not determined.
Flammability (solid, gas):	Product is not self-igniting.
Partition Coefficient:	Not determined.
Auto-ignition temperature:	Not determined.
Decomposition temperature:	Not determined.
Viscosity:	Not determined.
Specific Gravity:	Not determined.
Freezing Point:	Not determined.
Explosion Limits:	Not determined.
Oxidizing Properties:	Not an oxidizer.

9.2 Other information

Not applicable.

Section 10: Stability and Reactivity

10.1 Reactivity

No further relevant information available.

10.2 Chemical Stability

Stable under normal ambient and anticipated storage and handling conditions.

10.3 Possibility of hazardous reactions

Reacts with acids, alkalis and oxidizing agents.

10.4 Conditions to avoid

Acidic reducing environments.

10.5 Incompatible materials

Acidic reducing conditions.

10.6 Hazardous decomposition products

Oxides of nitrogen and carbon.

Section 11: Toxicological Information

11.1 Information on toxicological effects

Toxic kinetics

Antimony pentoxide: The oral absorption of soluble pentavalent antimony compounds is less than 1% (Felicetti, 1974; ICRP, 1981). Together with particle-size derived respiratory deposition and 100% absorption from the pulmonary fraction, an inhalation absorption factor of 0.7% may be assumed. Based on read-across and analogies with other metals HERAG (2007), a conservative default dermal absorption factor of 1% is appropriate for diantimony pentoxide.

Acute toxicity

Antimony pentoxide: Oral: LD50 rat > 2000 mg/kg bw (Robertson, 2005)
The classification criteria according to regulation (EC) 1272/2008 as acutely toxic are not met for APO since the ATE is above 2000 mg/kg body weight, hence no classification required.
Inhalation: LC50 rat > 5.4 mg/L (Leuschner, 2010)
The classification criteria according to regulation (EC) 1272/2008 as acutely toxic are not met for sodium hexahydroxoantimonate (CAS 33908-66-6) since the ATE for dusts and mists is above 5.0 mg/L, hence no classification required. Based on read across from SHHA, APO does not require a classification as acutely toxic, inhalation.

Dermal: APO does not require a classification as acutely toxic via dermal route. Conduct of an acute dermal toxicity study is unjustified as inhalation of the substance is considered as major route of exposure and physicochemical properties of the substance do not suggest a significant rate of absorption through the skin (cf. Annex VIII section 8.5 Column 2 of regulation (EC) 1907/2006).

Amines, tallow alkyl, ethoxylated: 300 – 2000 mg/kg (Oral, LD50, rat)

Skin corrosion/irritation

Antimony pentoxide: Based on available data, the classification criteria as skin irritant are not met for APO (Robertson, 2005). Since APO is not irritating to the skin, eyes or the respiratory tract, corrosive properties can be excluded and the classification criteria are not met.

Amines, tallow alkyl, ethoxylated: Irritating to the skin (rabbit).

Serious eye damage/irritation

Antimony pentoxide: Based on available data, the classification criteria as eye irritant are not met for sodium hexahydroxoantimonate (CAS 33908-66-6) (Leuschner, 2009). Based on read across from SHHA, APO does not require a classification as eye irritant.

Amines, tallow alkyl, ethoxylated: Risk of serious damage to eyes.

Respiratory or skin sensitization

Antimony pentoxide: Based on available data, the classification criteria as skin sensitizer are not met for diantimony pentoxide (Robertson, 2005). Based on the results of the histopathological and macroscopic investigations and on an industry survey, SHHA (CAS 33908-66-6) does not require a classification for respiratory irritation/sensitization. Based on read across from SHHA, and an industry survey, APO does not require classification for respiratory irritation/sensitization.

Germ cell mutagenicity

Antimony pentoxide: Based on available data, SHHA (CAS 33908-66-6) does not require a classification as germ cell mutagen. Sodium hexahydroxoantimonate (CAS# 33908-66-6) did not induce micronuclei in cultured human lymphocytes (Whitwell, 2010) and gene mutation in the tk locus of the L5178Y mouse lymphoma cell line (Stone, 2010). Therefore sodium hexahydroxoantimonate is considered as non-clastogenic and non-mutagenic. Based on read across from SHHA, APO does not require a classification as germ cell mutagen.

Carcinogenicity

Antimony pentoxide: No data indicating any concern for carcinogenicity.

Amines, tallow alkyl, ethoxylated: No data indicating any concern for carcinogenicity.

Reproductive toxicity

Antimony pentoxide: Data lacking – testing proposal issued in the REACH registration dossier of sodium hexahydroxoantimonate (CAS 33908-66-6). Data will be read-across to APO.

STOT-single exposure

Antimony pentoxide: Based on available data, the classification criteria as STOT, single exposure, oral and inhalation are not met for APO since no reversible or irreversible adverse health effects were observed immediately or delayed after exposure and no effects were observed at the guidance value.

STOT-repeated exposure

Antimony pentoxide: Data lacking – testing proposal issued in the REACH registration dossier of sodium hexahydroxoantimonate (CAS 33908-66-6). Data will be read-across to APO.

Aspiration hazard

Antimony pentoxide: APO as an inorganic metal oxide is void of a low surface tension effect and as a solid does have a very high viscosity, i.e. an aspiration hazard can safely be excluded. Based on available data, the classification criteria are not met.

Section 12: Ecological Information

12.1 Toxicity

Antimony pentoxide

Antimony metal and antimony containing compounds will dissolve and generate antimony ions (Vangheluwe et al., 2001). The environmental section will therefore discuss the fate of antimony in general.

Acute aquatic toxicity test results:		
Marine fish [<i>Pagrus major</i>]	96 h LC50	6.9 mg Sb/L (Takayanagi, 2001)
Freshwater fish [<i>Pimephales promelas</i>]	96 h LC50	14.4 mg Sb/L (Brooke et al, 1986)
Invertebrates [<i>Chlorohydra viridissimus</i>]	96 h LC50	1.77 mg Sb/L (TAI, 1990)
Algae [<i>Pseudokirchneriella subcapitata</i>]	72 h ErC50 (growth rate)	> 36.6 mg Sb/L (Heijerick et al, 2004)
Plants [<i>Lemna minor</i>]	4 d EC50	> 25.5 mg Sb/L (Brooke et al, 1986)
Chronic aquatic toxicity test results:		
Fish [<i>Pimephales promelas</i>]	28 d NOEC/LOEC (growth; length)	1.13/2.31 mg Sb/L (Kimball, 1978)
Invertebrates [<i>Daphnia magna</i>]	21 d NOEC/LOEC (reproduction)	1.74/3.13 mg Sb/L (Heijerick et al, 2003)
Algae [<i>Pseudokirchneriella subcapitata</i>]	72 h NOEC/LOEC (growth rate)	2.11/4.00 mg Sb/L (Heijerick et al, 2004)
Chronic sediment toxicity test results:		
Midge [<i>Chironomus riparius</i>]	14 d NOEC (growth)	78 mg Sb/kg ww (Heijerick et al, 2005)
Chronic terrestrial toxicity test results (values were determined in a soil spiked with Sb ₂ O ₃ and aged for 31 weeks before testing):		
Soil invertebrates	NOEC	999 mg Sb/kg dw (Moser, 2007)
Plants	NOEC	999 mg Sb/kg dw (Smolders et al., 2007)
Soil microorganisms	NOEC	2930 mg Sb/kg dw (Smolders et al., 2007)
Toxicity tests for microorganisms (for STP)		
Aquatic microorganisms	NOEC	2.55 mg Sb/L (EPAS, 2005)
Inhibition of nitrification	EC50	27 mg Sb/L (EPAS, 2005)

Amines, tallow alkyl, ethoxylated

Species	LC(E)50	Exposure time
Fish (rainbow trout)	0.13 mg/l	96 hr
Invertebrates (water flea)	0.17 mg/l	96 hr
Algae	0.1 –1 mg/l	72 hr

M-Factor: 1

12.2 Persistence and degradability

Antimony cannot be degraded, but may be transformed between different phases, chemical species, and oxidation states. Antimony is therefore considered to be persistent (P) and very persistent (vP) like any other metal.

12.3 Bioaccumulative potential

Bioaccumulation of antimony by both aquatic and terrestrial organisms is low. A BCF of 40 has been determined for aquatic organisms and a BASF of 1 for earthworms. Therefore, antimony is not considered bioaccumulative (B) or very bioaccumulative (vB) based on the definitive criteria. Bioaccumulation of amines, tallow alkyl, ethoxylated is not likely.

12.4 Mobility in soil

Reports claim that antimony compounds released in the environment are absorbed by the soil with no general mobility except in sandy soils. Some methylated antimony compounds can form in reducing conditions such as found in anaerobic sediment. A log K_p of 2.07 has been determined for soil.

12.5 Results of PBT and vPvB Assessment

The PBT and vPvB criteria of Annex XIII to the Regulation do not apply to inorganic substances, such as antimony and its inorganic compounds. However, the available data have been compared to the criteria:
 See 12.2 for (P) and 12.3 for (B). For (T): Chronic NOEC values are available for fish, invertebrates and algae (see Section 12). The lowest NOEC is 1.13 mg Sb/L for fish (Kimball, 1978). Antimony and antimony compounds do not meet any of the toxicity criteria based on carcinogenicity, mutagenicity or reprotoxicity and there is no evidence of other chronic concerns. Therefore, antimony is not considered toxic (T) based on the definitive criteria. Antimony, and therefore APO, is not PBT or vPvB.

12.6 Other adverse effects

Not expected to contribute to ozone depletion, ozone formation, global warming or acidification.

Section 13: Disposal Considerations

This information presented only applies to the materials as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

Disposal Considerations: Disposal must be made according to official regulation. Recycle or burn in a chemical incinerator.

United States: Not an RCRA classified hazardous waste.

Section 14: Transport Information

The product is not restricted for transportation.

Sections 14.1 – 14.4

Regulations

U.S. D.O.T.:	Not Regulated
ICAO/IATA:	Not Regulated
IMO/IMDG:	Not Regulated
ADR:	Not Regulated

14.5 Environmental Hazards

The product is not an environmental hazard in the EU.

14.6 Special precautions for user

Not available.

14.7 Transport bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable, the product is not sold in bulk quantities.

Section 15: Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Worldwide Chemical Inventories

EINECS (EU): All ingredients listed

TSCA (USA): All ingredients listed

DSL (Canada): All ingredients listed

AICS (Australia): All ingredients listed

ENCS (Japan): All ingredients listed

ECL (Korea): All ingredients listed

PICCS (Philippines): All ingredients listed

IECSC (China): All ingredients listed

SARA Section 311/312 (29 CFR 1910.1200) Hazards:

Acute health hazard

SARA Section 313: This product contains the following toxic chemicals subject to the reporting requirements of Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 and of 40 CFR 372:

<u>Chemical Name:</u>	<u>CAS #:</u>	<u>Percent by Weight:</u>
Antimony Pentoxide	1314-60-9	51

California Proposition 65: No ingredients listed.

State Right-to-Know Laws: Section 3 of this SDS lists all components of the product.

WHMIS: Not controlled.

15.2 Chemical safety assessment

A chemical safety assessment has been carried out for antimony pentoxide.

Section 16: Other Information

List of relevant phrases:

H302 – Harmful if swallowed.

H315 – Causes skin irritation.

H318 – Causes serious eye damage.

H400 – Very toxic to aquatic life.

National Fire Protection Association (U.S.A.) 704 Hazard Rating:

Health-1, Flammability-1, Reactivity-0, Special-None

HMIS® Hazard Rating:

Health-1 Flammability-1, Reactivity-0, Protective Equipment – B; safety glasses, gloves.

Recommended Use:

The product is recommended for use as a flame retardant. Other uses have not been investigated and may have other hazards. For industrial use only, not for food, drug or home use.

Work Alert:

Workers using the product should read and understand this SDS and be trained in the proper use of this material.

Other Special Considerations:

None known.

SDS Prepared By:

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Nyacol Nano Technologies, Incorporated

Revision Date:

Telephone: 508-881-2220 U.S.A.

Supersedes:

June 2, 2016

May 19, 2009

This SDS has been prepared with data from Nyacol Nano Technologies, Inc.'s laboratories, raw material suppliers, and government publications. Information herein is accurate to the best of our knowledge. Suggestions are made without warranty or guarantee of results. Before using, the user should determine the suitability of the products for the intended use, and the user assumes the risk and liability in connection therewith. We do not suggest violation of any existing patents or give permission to practice any patented invention without license.

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