Substance key: 000000426366	Revision Date: 06/02/2015
Version : 3 - 1 / USA	Date of printing :08/17/2015

SECTION 1. IDENTIFICATION

Identification of the company:	Clariant Produkte (Deutschland) GmbH Frankfurt am Main, 65926 Telephone No.: +49 69 305 18000 **Information of the substance/preparation:** Product Safety 1-704-331-7710 **Emergency tel. number:** +1 800-424-9300 CHEMTREC

Trade name:	**Exolit RP 614 Presscake (TP)**
Material number:	241572
Primary product use:	Flame retardants
Restrictions on use :	Industrial manufacture of screening smoke ammunition or smoke payloads. Screening smoke ammunition and smoke payloads are produced by mixing red phosphorus with oxidizing substances which will lead to an explosive mixture. The safe use of explosive mixtures cannot be described in an exposure assessment according to Regulation (EC) No. 1907/2006. Thus this use is not supported.
Chemical family:	red phosphorus, stabilized, micro encapsulated with melamin/formaldehyde resins as a wet filtercake

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Flammable solids	:	Category 1
Skin sensitisation	:	Category 1
Specific target organ toxicity - repeated exposure (Oral)	:	Category 2

GHS Label element

Hazard pictograms :

Signal word : Danger

Hazard statements : H228 Flammable solid.
H317 May cause an allergic skin reaction.
H373 May cause damage to organs through prolonged or repeated exposure if swallowed.

Precautionary statements : **Prevention:**

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P260 Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves/ eye protection/ face protection.
Response:
P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P314 Get medical advice/ attention if you feel unwell.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P363 Wash contaminated clothing before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
Disposal:
P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous components

Chemical Name	CAS-No.	Concentration (%)
Tin sulphate	7488-55-3	< 3
Red phosphorus	7723-14-0	< 80

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

SECTION 4. FIRST AID MEASURES

General advice : Remove/Take off immediately all contaminated clothing.
Get medical attention.

If inhaled : Move the victim to fresh air.
Give oxygen or artificial respiration if needed.
Get immediate medical advice/ attention.
Never give anything by mouth to an unconscious person.

In case of skin contact : In case of contact with skin, wash affected area thoroughly with soap and water. In case of burns with phosphorous, shower in cold water for at least 10 minutes while removing clothes and shoes. Remove any phosphorus adhering to the skin with more water and douse with a 2% copper sulfate solution. Cover the burned areas with sterile dressings and keep the dressing moist. Get immediate medical attention. Removal of solidified, molten phosphorus should only be removed by qualified medical personnel.

In case of eye contact	:	Flush eyes with water at least 15 minutes. Get medical attention if eye irritation develops or persists.
If swallowed	:	If conscious, give the victim plenty of water to drink. Consult a physician. Never give anything by mouth to an unconscious person.
Most important symptoms and effects, both acute and delayed	:	The possible symptoms known are those derived from the labelling (see section 2). No additional symptoms are known.
Notes to physician	:	After a burn to the skin caused by phosphorus, any residual product adhering to the wound must be removed mechanically with a brush in order to prevent further burns or toxic effects through dermal absorption of yellow phosphorus. The wound must then be rinsed immediately with a commercial solution of 2% copper sulphate in order to neutralise any residual yellow phosphorous. Any such wound must be kept damp in all circumstances during movement of the victim for further medical treatment, so that any residual yellow phosphorus does not lead to further inflammation.

SECTION 5. FIREFIGHTING MEASURES

Suitable extinguishing media	:	Foam
Unsuitable extinguishing media	:	gaseous extinguishing media Carbon dioxide (CO_2)
Specific hazards during firefighting	:	In case of fire hazardous decomposition products may be produced such as: Phosphorus oxides (eg Phosphorus pentoxide) Phosphorus pentoxide in air forms a dense, non-transparent, corrosive mist of phosphoric acid. Emits toxic and corrosive fumes under fire conditions. Fine powder may present dust explosion hazard. May form explosive mixtures with oxidizing agents. May be ignited by friction, heat, sparks, or flames. Powders and dusts may explode or burn with explosive violence. In case of combustion, yellow/white phosphorus is reformed, which may cause self-ignition of areas already extinguished. In order to avoid self-ignition, fire residues should be kept damp or under water.
Further information	:	Fire fighters should wear fire resistant protective clothing and NIOSH approved self-contained breathing apparatus. Water spray, water spray with detergent, sand or foam containing surfactants should be used for containing the fire. For safety

reasons, gaseous extinguishing media or carbon dioxide must not be used. In case of fires, hazardous combustion gases such as oxides of phosphorous are formed. Fight fire from a safe distance due to explosion hazard. Cover extinguished areas with 10 % copper sulfate or soda solution. Detergents may be added to the solutions.

Special protective equipment for firefighters : Self-contained breathing apparatus
In case of fire, use acid-resistant equipment / personal protective equipment.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : See: Exposure controls and personal protection.
Remove all spark producing devices or ignition sources. Wear proper personnel protective equipment. Dampen carefully and collect into suitable container for disposal. Do not allow to dry out.
Prevent from entering into soil, ditches, sewers, waterways and/or groundwater.

Environmental precautions : The product should not be allowed to enter drains, water courses or the soil.
Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

Methods and materials for containment and cleaning up : Dampen dust and place it in a properly closed receptacle and dispose of it safely.
Do not allow to dry.
Avoid dust formation.
Carefully oxidise small amounts (e.g. with diluted bleaching powder solution, hydrogen peroxide solution)

SECTION 7. HANDLING AND STORAGE

Advice on protection against fire and explosion : Do not allow to dry. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge. Render equipment and apparatus inert (nitrogen, inert gases) and earth before putting into operation Avoid impact, friction and accumulation of electrostatic charge Use only non-sparking tools. Avoid dust formation. Always keep working area moist and well-ventilated Cover extinguished areas with 10% copper sulphate or sode solution. Detergents may be added to the solutions

Advice on safe handling : Use personal protective equipment.
Avoid breathing dust.
Avoid contact with skin and eyes.
Wash thoroughly after handling.
Store in a dry place.
Keep away from heat.

Store in original container.
Keep container tightly closed.
Avoid contact with skin, eyes and clothing.
Wash thoroughly after handling.
Avoid dust formation. Keep away from sources of ignition.
Lead off electrostatic charges.
Avoid impact, friction and accumulation of electronic charge.
Keep working area moist and well ventilated.
Ensure that dried product residues are re-dampened before transferring, handling or transporting.

Technical measures/Precautions : Store in original container.
Keep container tightly closed.
Store in a cool, dry, well-ventilated area.

Materials to avoid : Do not store with strong oxidizing agents

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
Tin sulphate	7488-55-3	TWA	2 mg/m3 (Tin)	OSHA Z-1
		TWA	2 mg/m3 (Tin)	ACGIH
	Further information: Eye & Upper Respiratory Tract irritation, Headache, Pneumoconiosis, Nausea, varies			
		TWA	2 mg/m3 (Tin)	OSHA P0
		TWA	2 mg/m3 (Tin)	NIOSH REL
		TWA	2 mg/m3 (Tin)	ACGIH
	Further information: Pneumoconiosis (or Stannosis), varies			

Engineering measures : Local ventilation recommended - mechanical ventilation may be used.

Local ventilation recommended - mechanical ventilation may be used.

Personal protective equipment

Respiratory protection : Use NIOSH/MSHA approved respirators following manufacturer's recommendations where dust or fume may be generated.

Hand protection
Remarks : Nitrile rubber gloves.

Eye protection : safety glasses/face shield

Skin and body protection : Flame-resistant clothing
Wear shoes with conductive soles.

Hygiene measures : Clean skin thoroughly after work; apply skin cream.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : wet powder

Colour : red brown

Odour : odourless

Odour Threshold : not determined

pH : approx. 7
Concentration: 100 g/l (20 ℃)Suspension in water

Melting point (decomposition) : 600 ℃

Boiling point : Study not performed as melting point is above 300 °C (REACH exemption Annex VII).

Flash point : Not applicable

Evaporation rate : Not applicable

Flammability (solid, gas) : The substance or mixture is a flammable solid with the category 1.

Upper explosion limit : Not applicable

Lower explosion limit : Not applicable

Combustion number : BZ5 Complete combustion with flames

Vapour pressure :
Corresp. to vapour pressure of water

Relative vapour density : Not applicable

Density : 2 g/cm3 (25 ℃)

Bulk density : Not applicable

Solubility(ies)
Water solubility : insoluble

Partition coefficient: n-octanol/water	:	Not applicable
Auto-ignition temperature	:	> 290 ℃
Decomposition temperature	:	not tested.
Viscosity		
Viscosity, dynamic	:	Not applicable
Viscosity, kinematic	:	Not applicable
Impact sensitivity	:	Impact sensitive.
Surface tension	:	This property is not applicable for mixtures.

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	No dangerous reaction known under conditions of normal use.
Chemical stability	:	Stable
Possibility of hazardous reactions	:	Explosive when dry. Explosive reactions with oxidising agents such as potassium chlorate and/or peroxides. At high temperatures small amounts of hydrogen phosphide are formed with water. The substance or mixture does not emit flammable gases in contact with water. Not corrosive to metals Stable
Conditions to avoid	:	In dried state: sparks Thermal decomposition ignition shock friction Reactions with peroxides. Can cause explosive reactions with oxidizing agents such as potassium chlorate and/or peroxides. At high temperatures small amounts of hydrogen phosphide are formed with water.
Incompatible materials	:	oxidants
Hazardous decomposition products	:	Hydrogen phosphide White/yellow phosphorus

SECTION 11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure
Eye contact
Skin contact
Ingestion
Inhalation

Acute toxicity

Product:

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

Components:

Tin sulphate:
Acute oral toxicity : LD50 (Rat): 2,207 mg/kg
Method: OECD Test Guideline 401

Red phosphorus:
Acute oral toxicity : LD50 (Rat, female): > 15,000 mg/kg
Method: OECD Test Guideline 401
GLP: no

Acute inhalation toxicity : Remarks: cannot be determined

Acute dermal toxicity : Remarks: not required

Skin corrosion/irritation

Product:

Species: Rabbit
Result: slightly irritating

Components:

Red phosphorus:
Species: Rabbit
Exposure time: 24 h
Method: OECD Test Guideline 404
Result: No skin irritation
GLP: no

Serious eye damage/eye irritation

Product:

Species: rabbit eye
Result: slightly irritating
Method: FDA guideline

Components:

Red phosphorus:
Species: rabbit eye
Result: No eye irritation
Exposure time: 24 h
Method: OECD Test Guideline 405
GLP: no

Respiratory or skin sensitisation

Product:

Remarks: not tested.

Components:

Red phosphorus:
Test Type: Buehler Test
Species: Guinea pig
Method: OECD Test Guideline 406
Result: non-sensitizing
GLP: no

Germ cell mutagenicity

Components:

Red phosphorus:

Genotoxicity in vitro

: Test Type: Ames test
Species: Salmonella typhimurium
Concentration: 3 - 5000 mg/plate
Metabolic activation: with and without
Method: OECD Test Guideline 471
Result: negative
GLP: yes

: Test Type: Ames test
Species: Escherichia coli
Concentration: 3 - 5000 mg/plate
Metabolic activation: with and without
Method: OECD Test Guideline 471
Result: negative
GLP: yes

: Test Type: Chromosome Aberration Test
Species: V79 cells (embryonic lung fibroblasts) of the Chinese hamster
Concentration: 2,3 - 5000 µg/ml
Metabolic activation: with and without
Method: OECD Test Guideline 473
Result: negative
GLP: yes

: Test Type: HGPRT assay
Species: V79 cells (embryonic lung fibroblasts) of the Chinese hamster

Concentration: 1,3 - 60 µg/ml
Metabolic activation: with and without
Method: OECD Test Guideline 476
Result: negative
GLP: yes

Germ cell mutagenicity - Assessment : No information available.

Carcinogenicity

Components:

Red phosphorus:
Remarks: From scientific point of view the study is not necessary.

Carcinogenicity - Assessment : Not applicable

IARC	Not listed
OSHA	Not listed
NTP	Not listed

Reproductive toxicity

Components:

Red phosphorus:
Reproductive toxicity - Assessment : No reproductive toxicity to be expected.

No teratogenic effects to be expected.

STOT - single exposure

Components:

Red phosphorus:
Remarks: not available

STOT - repeated exposure

Components:

Red phosphorus:
Remarks: not available

Repeated dose toxicity

Components:

Red phosphorus:
Method: Repeated dose toxicity
Remarks: The study is not necessary from a scientific perspective.

Aspiration toxicity

Components:

Red phosphorus:
no data available

Experience with human exposure

Product:

General Information : The possible symptoms known are those derived from the labelling (see section 2).

Components:

Red phosphorus:
General Information : When used as intended, no effects to health are expected.

Further information

Components:

Red phosphorus:
Remarks: Frequent contact can lead to skin and eye irritation, especially if product is allowed to dry out

Remarks: Since 1997 the lung function of about 70 workers has been examined annually and documented, which showed no change of lung function associated with red phosphorus dust.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Tin sulphate:
Toxicity to algae : EC50 (Skeletonema costatum): 0.2 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Red phosphorus:
Toxicity to fish : LC50 (Danio rerio (zebra fish)): 33.2 mg/l
Exposure time: 96 h
Test Type: static test
Analytical monitoring: no
Method: OECD Test Guideline 203
GLP: yes
Remarks: The details of the toxic effect relate to the nominal concentration.

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 10.5 mg/l
Exposure time: 48 h
Test Type: static test
Analytical monitoring: no
Method: OECD Test Guideline 202

GLP: yes
Remarks: The details of the toxic effect relate to the nominal concentration.

Toxicity to algae : EC50 (Desmodesmus subspicatus (Scenedesmus subspicatus)): 18.5 mg/l
End point: Growth rate
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 201
GLP: yes
Remarks: The details of the toxic effect relate to the nominal concentration.

NOEC (Desmodesmus subspicatus (Scenedesmus subspicatus)): 5 mg/l
End point: Growth rate
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Method: OECD Test Guideline 201
GLP: yes
Remarks: The details of the toxic effect relate to the nominal concentration.

Toxicity to fish (Chronic toxicity) : Remarks: Not applicable

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : Remarks: not reasonable

Toxicity to bacteria : EC50 (activated sludge): > 1,000 mg/l
Exposure time: 3 h
Test Type: Respiration inhibition
Analytical monitoring: no
Method: OECD Test Guideline 209
GLP: yes

Toxicity to soil dwelling organisms : Test Type: artificial soil
NOEC (Eisenia fetida (earthworms)): 125 mg/kg
Exposure time: 56 d
End point: Reproduction
Method: OECD Test Guideline 222
GLP: yes

Test Type: artificial soil
LOEC (Eisenia fetida (earthworms)): 250 mg/kg
Exposure time: 56 d
End point: Reproduction
Method: OECD Test Guideline 222
GLP: yes

Test Type: artificial soil
EC50 (Eisenia fetida (earthworms)): 428 mg/kg
Exposure time: 56 d
End point: Reproduction
Method: OECD Test Guideline 222
GLP: yes

Test Type: artificial soil
NOEC (soil dwelling microorganisms): 1,000 mg/kg
Exposure time: 28 d
End point: Other
Method: Other
GLP: yes

Test Type: artificial soil
NOEC (Nematode Caenorhabditis elegans): 1,000 mg/kg
Exposure time: 96 h
End point: Other
Method: Other
GLP: yes

Test Type: artificial soil
LOEC (Nematode Caenorhabditis elegans): > 1,000 mg/kg
Exposure time: 96 h
End point: Other
Method: Other
GLP: yes

Plant toxicity : Remarks: The study is not necessary from a scientific perspective.

Sediment toxicity : NOEC (Lumbriculus variegatus (Worm)): 1000 mg/kg
Duration: 28 d
Sediment: artificial soil
Exposure duration: 28 d
Test substance: artificial soil
Method: OECD 225
GLP: yes

Persistence and degradability

Product:

Biodegradability : Remarks: This property is substance specific and cannot be given for the preparations.

Components:

Red phosphorus:

Biodegradability : Primary biodegradation
Remarks: Not applicable for inorganic compound.

Physico-chemical : Remarks: Not applicable due to insolubility in water. This

removability		product does not come into contact with the effluent when it is used for its purpose, otherwise it can be removed by filtration operations.
Stability in water	:	Test Type: abiotic Method: OECD Test Guideline 111 GLP: yes Remarks: Forms in contact with water slowly phosphine and phosphor oxidization products.

Bioaccumulative potential

Product:

Bioaccumulation	:	Remarks: No information is available on the mixture "as is". If relevant information is available on the substances listed in Chapter 3, it is reported here.

Components:

Red phosphorus:

Bioaccumulation	:	Remarks: Bioaccumulation is unlikely.
Partition coefficient: n-octanol/water	:	Remarks: Not applicable

Mobility in soil

Product:

Distribution among environmental compartments	:	Remarks: No information is available on the mixture "as is". If relevant information is available on the substances listed in Chapter 3, it is reported here.

Components:

Red phosphorus:

Distribution among environmental compartments	:	adsorption Medium: water - soil Remarks: Not applicable

Other adverse effects

Product:

Additional ecological information	:	The product should not be allowed to enter drains, water courses or the soil.

Components:

Red phosphorus:

Environmental fate and pathways	:	not available

Results of PBT and vPvB assessment	:	The substance is inorganic, thus a PBT and vPvB criteria assessment is not applicable according to Annex XIII of Regulation (EC) 1907/2006.
Additional ecological information	:	The product should not be allowed to enter drains, water courses or the soil. Since Red phosphorus is an amorphous polymeric form of elemental phosphorus, it is insoluble in water and organic solvents. However, slow disproportionating and oxidizing reactions produce traces of phosphine (strong smell and is toxic), but mainly phosphorus acids (H3PO4, H3PO3, H3PO2) as well as traces of unknown phosphorus compounds. These reaction products (particularly phosphine) are the cause of the toxic effects to organisms of red phosphorus. These reactions are increased by high temperatures and moisture.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

RCRA - Resource Conservation and Recovery Authorization Act	:	Yes -- If it becomes a waste as sold.
Waste Code	:	D001
Waste from residues	:	Small quantities may be treated in aerobic wastewater treatment systems. Larger quantities may be incinerated or landfilled after solidification in permitted systems. Contain and dispose of waste according to local regulations. Incineration in an approved, controlled furnace with combustion gas scrubbing and emission gas control.
Contaminated packaging	:	Packaging that cannot be cleaned should be disposed of as product waste Used bags of PE should be wetted outside and inside with water before being destroyed, to avoid dust explosions

SECTION 14. TRANSPORT INFORMATION

DOT Regulation:

Proper shipping name:	Phosphorus, amorphous, mixture
Hazard class:	4.1
Packing group:	III
UN/NA-number:	UN 1338
Primary hazard class:	4.1
Reportable Quantity:	0.631 kg Phosphorus, amorphous
Reportable Quantity:	0.631 kg Phosphorus, amorphous

IATA

Proper shipping name:	Phosphorus, amorphous, mixture
Class:	4.1
Packing group:	III
UN/ID number:	UN 1338
Primary risk:	4.1
Remarks:	Shipment permitted

IMDG

Proper shipping name:	Phosphorus, amorphous, mixture
Class:	4.1
Packing group:	III
UN no.:	UN 1338
Primary risk:	4.1
EmS:	F-A S-G

SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Red phosphorus	7723-14-0	1	

SARA 304 Extremely Hazardous Substances Reportable Quantity

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
Red phosphorus	7723-14-0	1	

SARA 311/312 Hazards : Acute Health Hazard
Chronic Health Hazard
Fire Hazard
Reactivity Hazard

SARA 302 :

Red phosphorus	7723-14-0	80 %

SARA 313 : This product does not contain any toxic chemical listed under Section 313 of the Emergency Planning and Community Right-To-Know Act of 1986.

Clean Water Act

Contains no known priority pollutants at concentrations greater than 0.1%.
Contains red phosphorus at concentrations > 0.1%, a CWA Section 311 hazardous chemical.

The components of this product are reported in the following inventories:

TSCA : On TSCA Inventory

Inventories

AICS (Australia), DSL (Canada), IECSC (China), REACH (European Union), ENCS (Japan), ISHL (Japan), KECI (Korea), NZIoC (New Zealand), PICCS (Philippines), TSCA (USA)

SECTION 16. OTHER INFORMATION

Further information

On the basis of an extensive test program, which had to be submitted to the competent authority on the occasion of the Notification of the substance in the European Community, this product was found to be toxicologically not dangerous within the meaning of the EC Directives.
Drying the suspension renders it highly flammable and gives rise to an explosion hazard when mixed with oxidizing substances.
This substance may be toxic to fish or aquatic organisms.
Do not allow to enter drains or waterways
Dispose of waste product or used containers according to local regulations.

Revision Date : 06/02/2015

This information is supplied under the OSHA Hazard Communication Standard, 29 CFR 1910.1200, and is offered in good faith based on data available to us that we believe to be true and accurate. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable to the material. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate for that use. No warranty, express or implied, is made regarding the accuracy of this data, the hazards connected with the use of the material, or the results to be obtained from the use thereof. We assume no responsibility for damage or injury from the use of the product described herein. Data provided here are typical and not intended for use as product specifications.

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