

Date of issue 2/23/2024 (month/day/year)

Version 3.04

Section 1. Chemical product and company identification

- A. Product name** : SIGMAPRIME CSF HARDENER
Product code : 00444306
- B. Relevant identified uses of the substance or mixture and uses advised against**
Product use : Professional applications, Used by spraying.
Use of the substance/ mixture : Coating.
Uses advised against : Product is not intended, labelled or packaged for consumer use.
- C. Supplier's or Importer's information** : PPG SSC
 (680-090)
 19, Yecheon-ro 217beon-gil, Nam-gu,
 Ulsan, Korea
 Tel: +82-52-210-8222
Email Address : Korea.MSDS@PPG.COM
Emergency telephone number: : ☎82-52-210-8331

Section 2. Hazards identification

- A. Hazard classification** : CORROSIVE TO METALS - Category 1
 ACUTE TOXICITY (oral) - Category 4
 ACUTE TOXICITY (dermal) - Category 4
 SKIN CORROSION - Category 1C
 SERIOUS EYE DAMAGE - Category 1
 SKIN SENSITIZATION - Category 1
 AQUATIC HAZARD (LONG-TERM) - Category 2

This product is classified in accordance with the Industrial Safety and Health Act and the Chemical Control Act.

B. GHS label elements, including precautionary statements

Symbol :



Signal word : Danger

Hazard statements : H290 - May be corrosive to metals.
 H302 + H312 - Harmful if swallowed or in contact with skin.
 H314 - Causes severe skin burns and eye damage.
 H317 - May cause an allergic skin reaction.
 H411 - Toxic to aquatic life with long lasting effects.

Section 2. Hazards identification

Precautionary statements

Prevention

- : P280 - Wear protective gloves, protective clothing and eye or face protection.
- P234 - Keep only in original packaging.
- P273 - Avoid release to the environment.
- P261 - Avoid breathing vapor.
- P270 - Do not eat, drink or smoke when using this product.
- P264 - Wash thoroughly after handling.

Response

- : P391 - Collect spillage.
- P390 - Absorb spillage to prevent material damage.
- P304 + P310 - IF INHALED: Immediately call a POISON CENTER or doctor.
- P301 + P310, P330, P331 - IF SWALLOWED: Immediately call a POISON CENTER or doctor. Rinse mouth. Do NOT induce vomiting.
- P303 + P361 + P353, P310 - IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water. Immediately call a POISON CENTER or doctor.
- P363 - Wash contaminated clothing before reuse.
- P302 + P312, P352 - IF ON SKIN: Call a POISON CENTER or doctor if you feel unwell. Wash with plenty of water.
- P333 + P313 - If skin irritation or rash occurs: Get medical advice or attention.
- P305 + P351 + P338, P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.

Storage

- : Not applicable.

Disposal

- : P501 - Dispose of contents and container in accordance with all local, regional, national and international regulations.

- C. Other hazards which do not result in classification** : Contains a substance that may emit formaldehyde if stored beyond its shelf life and/or during cure at curing temperatures greater than 60C (140F).

Section 3. Composition/information on ingredients

CAS number/other identifiers

CAS number

- : Not applicable.

Chemical name	Common name	Identifiers	%
2-Propenenitrile reaction products with ethylenediamine, hydrogenated, reaction products with benzaldehyde, diethylenetriamine and triethylenetetramine, hydrogenated	2-Propenenitrile reaction products with ethylenediamine, hydrogenated, reaction products with benzaldehyde, diethylenetriamine and triethylenetetramine, hydrogenated	CAS: 1173092-74-4	80 - <90
2,6-di-tert-butyl-p-cresol	BUTYLATED HYDROXYTOLUENE	CAS: 128-37-0	5 - <10
Formaldehyde, oligomeric reaction products with phenol	Formaldehyde, oligomeric reaction products with phenol	CAS: 9003-35-4	1 - <5
3-aminopropyldiethylamine	3-Aminopropyldiethylamine	CAS: 104-78-9	1 - <5

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

- A. Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek immediate medical attention.
- B. Skin contact** : Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognized skin cleanser. Do NOT use solvents or thinners.
- C. Inhalation** : Remove to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel.
- D. Ingestion** : If swallowed, seek medical advice immediately and show this container or label. Keep person warm and at rest. Do NOT induce vomiting.
- E. Notes to physician** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- Specific treatments** : No specific treatment.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

- A. Extinguishing media**
- Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media** : None known.
- B. Specific hazards arising from the chemical** : In a fire or if heated, a pressure increase will occur and the container may burst. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.
- Hazardous thermal decomposition products** : Decomposition products may include the following materials:
carbon oxides
nitrogen oxides
Formaldehyde.
- C. Special equipment for fire-fighting** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.
- Fire-fighting procedures** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Section 6. Accidental release measures

- A. Personal precautions, protective equipment and emergency procedures** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- B. Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.
- C. Methods and materials for containment and cleaning up**
- Small spill** : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Absorb spillage to prevent material damage. Dispose of via a licensed waste disposal contractor.
- Large spill** : Stop leak if without risk. Move containers from spill area. Absorb spillage to prevent material damage. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

- A. Precautions for safe handling** : Put on appropriate personal protective equipment (see Section 8). Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container. Absorb spillage to prevent material damage.
- B. Conditions for safe storage, including any incompatibilities** : Store between the following temperatures: 0 to 35°C (32 to 95°F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Store in a corrosion resistant container with a resistant inner liner. Store locked up. Keep away from metals. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

Section 8. Exposure controls/personal protection

A. Occupational exposure limits

Ingredient name	Exposure limits
2,6-di-tert-butyl-p-cresol	Ministry of Employment and Labor (Republic of Korea, 1/2020). TWA: 2 mg/m ³ 8 hours. Form: Inhalable fraction and vapor

Recommended monitoring procedures : Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

B. Appropriate engineering controls : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

C. Personal protective equipment

Respiratory protection : Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. If workers are exposed to concentrations above the exposure limit, they must use appropriate, certified respirators. Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.

Eye protection : Chemical splash goggles and face shield.

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.

Gloves : nitrile neoprene

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Section 9. Physical and chemical properties

The conditions of measurement of all properties are at standard temperature and pressure unless otherwise indicated.

- A. Appearance

Physical state

: Liquid.

Color

: Not available.
- B. Odor

: Characteristic.
- C. Odor threshold

: Not available.
- D. pH

: Not applicable.
- E. Melting/freezing point

: Not available.
- F. Boiling point/boiling range

: >37.78°C (>100°F)
- G. Flash point

: Closed cup: 157°C (314.6°F)
- H. Evaporation rate

: Not available.
- I. Flammability (solid, gas)

: Not available.
- J. Lower and upper explosive (flammable) limits

: Greatest known range: Lower: 1.1% Upper: 7.5% (3-aminopropyldiethylamine)
- K. Vapor pressure

:

Ingredient name	Vapor Pressure at 20°C			Vapor pressure at 50°C		
	mm Hg	kPa	Method	mm Hg	kPa	Method
3-aminopropyldiethylamine	1.49713	0.2				
- L. Solubility(ies)

:

Media	Result
cold water	Not soluble
- Solubility in water

: Not available.

M. Vapor density

: Not available.

N. Relative density

: 1

O. Partition coefficient: n-octanol/water

: Not applicable.

P. Auto-ignition temperature

: Not available.

Q. Decomposition temperature

: Not available.

R. Viscosity

: Kinematic (40°C (104°F)): >21 mm²/s (>21 cSt)

S. Flow time (ISO 2431)

: Not available.

S. Molecular weight

: Not applicable.

Section 10. Stability and reactivity

- A. Chemical stability** : The product is stable.
- Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.
- B. Conditions to avoid** : When exposed to high temperatures may produce hazardous decomposition products.
- C. Incompatible materials** : Keep away from the following materials to prevent strong exothermic reactions: oxidizing agents, strong alkalis, strong acids.
- D. Hazardous decomposition products** : Depending on conditions, decomposition products may include the following materials: carbon oxides nitrogen oxides Formaldehyde.

Section 11. Toxicological information

- A. Information on the likely routes of exposure** : Not available.

Potential acute health effects

- Inhalation** : No known significant effects or critical hazards.
- Ingestion** : Harmful if swallowed.
- Skin contact** : Causes severe burns. Harmful in contact with skin. May cause an allergic skin reaction.
- Eye contact** : Causes serious eye damage.

Over-exposure signs/symptoms

- Inhalation** : No specific data.
- Ingestion** : Adverse symptoms may include the following:
stomach pains
- Skin contact** : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur
- Eye contact** : Adverse symptoms may include the following:
pain
watering
redness

B. Health hazards

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
2-Propenenitrile reaction products with ethylenediamine, hydrogenated, reaction products with benzaldehyde, diethylenetriamine and triethylenetetramine, hydrogenated	LD50 Oral	Rat	500 mg/kg	-
2,6-di-tert-butyl-p-cresol	LD50 Dermal	Rabbit	>5000 mg/kg	-
3-aminopropyldiethylamine	LD50 Dermal	Rabbit	524 mg/kg	-
	LD50 Oral	Rat	830 mg/kg	-

- Conclusion/Summary** : There are no data available on the mixture itself.

Section 11. Toxicological information

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
3-aminopropyldiethylamine	Skin - Visible necrosis	Rabbit	-	1 minutes	8 days

Conclusion/Summary

Skin : There are no data available on the mixture itself.

Eyes : There are no data available on the mixture itself.

Respiratory : There are no data available on the mixture itself.

Sensitization

Conclusion/Summary

Skin : There are no data available on the mixture itself.

Respiratory : There are no data available on the mixture itself.

Mutagenicity

Conclusion/Summary : There are no data available on the mixture itself.

Carcinogenicity

Conclusion/Summary : There are no data available on the mixture itself.

Reproductive toxicity

Conclusion/Summary : There are no data available on the mixture itself.

Teratogenicity

Conclusion/Summary : There are no data available on the mixture itself.

Specific target organ toxicity (single exposure)

Name	Classification	Route of exposure	Target organs
Formaldehyde, oligomeric reaction products with phenol	Category 3	-	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Name	Classification	Route of exposure	Target organs
2,6-di-tert-butyl-p-cresol	Category 2	-	-

Aspiration hazard

Not available.

Potential chronic health effects

General : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Reproductive toxicity : No known significant effects or critical hazards.

Section 11. Toxicological information

Additional information

Contains a substance that may emit formaldehyde if stored beyond its shelf life and/or during cure at curing temperatures greater than 60C (140F). Exposure to amine vapor has been reported to cause transient corneal edema described as blue haze, halo effect, foggy or blurred vision for several hours. This condition is typically temporary and does not cause permanent visual effects. When the proper eye protection specified in Section 8 is worn, exposure is significantly reduced and the condition has not been observed.

Chemical name	Identifiers	GHS Classification
2-Propenenitrile reaction products with ethylenediamine, hydrogenated, reaction products with benzaldehyde, diethylenetriamine and triethylenetetramine, hydrogenated	CAS: 1173092-74-4	CORROSIVE TO METALS - Category 1
2,6-di-tert-butyl-p-cresol	CAS: 128-37-0	ACUTE TOXICITY (oral) - Category 4 SKIN CORROSION - Category 1C SERIOUS EYE DAMAGE - Category 1 SKIN SENSITIZATION - Category 1B SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2 AQUATIC HAZARD (ACUTE) - Category 1 AQUATIC HAZARD (LONG-TERM) - Category 1 EYE IRRITATION - Category 2A
Formaldehyde, oligomeric reaction products with phenol	CAS: 9003-35-4	SKIN SENSITIZATION - Category 1B SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (Respiratory tract irritation) - Category 3
3-aminopropyldiethylamine	CAS: 104-78-9	FLAMMABLE LIQUIDS - Category 3 CORROSIVE TO METALS - Category 1 ACUTE TOXICITY (oral) - Category 4 ACUTE TOXICITY (dermal) - Category 3 SKIN CORROSION - Category 1 SERIOUS EYE DAMAGE - Category 1 SKIN SENSITIZATION - Category 1B

Section 12. Ecological information

A. Ecotoxicity

Product/ingredient name	Result	Species	Exposure
Formaldehyde, oligomeric reaction products with phenol	Acute EC50 172 mg/l	Daphnia	48 hours
3-aminopropyldiethylamine	Acute EC50 30.2 mg/l Acute EC50 146.6 mg/l	Daphnia Fish	48 hours 96 hours

B. Persistence and degradability

Product/ingredient name	Test	Result	Dose	Inoculum
3-aminopropyldiethylamine	OECD 301A	90 % - Readily - 28 days	-	-

Section 12. Ecological information

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
3-aminopropyldiethylamine	-	-	Readily

C. Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
2,6-di-tert-butyl-p-cresol	5.1	1071.52	High

D. Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

E. Other adverse effects : No known significant effects or critical hazards.

Section 13. Disposal considerations

- A. Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.
- B. Disposal precautions** : This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	UN	IMDG	IATA
A. UN number	UN2735	UN2735	UN2735
B. UN proper shipping name	AMINES, LIQUID, CORROSIVE, N.O.S. (2-Propenenitrile reaction products with ethylenediamine, hydrogenated, reaction products with benzaldehyde, diethylenetriamine and triethylenetetramine, hydrogenated, 3-aminopropyldiethylamine)	AMINES, LIQUID, CORROSIVE, N.O.S. (2-Propenenitrile reaction products with ethylenediamine, hydrogenated, reaction products with benzaldehyde, diethylenetriamine and triethylenetetramine, hydrogenated, 3-aminopropyldiethylamine)	AMINES, LIQUID, CORROSIVE, N.O.S. (2-Propenenitrile reaction products with ethylenediamine, hydrogenated, reaction products with benzaldehyde, diethylenetriamine and triethylenetetramine, hydrogenated, 3-aminopropyldiethylamine)
C. Transport hazard class(es)	8	8	8
D. Packing group	III	III	III

Section 14. Transport information

Environmental hazards	Yes. The environmentally hazardous substance mark is not required.	Yes.	Yes. The environmentally hazardous substance mark is not required.
E. Marine pollutant substances	Not applicable.	(2,6-di-tert-butyl-p-cresol)	Not applicable.

Additional information

- UN** : None identified.
- IMDG** : The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg.
- IATA** : The environmentally hazardous substance mark may appear if required by other transportation regulations.

F. Special precaution which a user to be aware of or needs to comply with in connection with transport or transportation

Transport within user’s premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to IMO instruments : Not applicable.

Section 15. Regulatory information

A. Regulation according to ISHA

- ISHA article 117 (Harmful substances prohibited from manufacture)** : None of the components are listed.
- ISHA article 118 (Harmful substances requiring permission)** : None of the components are listed.
- Article 2 of Youth Protection Act on Substances Hazardous to Youth** : It is not allowed to sell to persons under the age of 19.

Exposure Limits of Chemical Substances and Physical Factors

The following components have an OEL:
2,6-di-tert-butyl-p-cresol

- ISHA Enforcement Regs Annex 19 (Exposure standards established for harmful factors)** : None of the components are listed.
- ISHA Enforcement Regs Annex 21 (Harmful factors subject to Work Environment Measurement)** : None of the components are listed.

Section 15. Regulatory information

ISHA Enforcement Regs : None of the components are listed.

Annex 22 (Harmful Factors Subject to Special Health Check-up)

Standard of Industrial Safety and Health : None of the components are listed.

Annex 12 (Hazardous substances subject to control)

B. Regulation according to Chemicals Control Act

Article 11 (TRI) : The following components are listed: 2,6-Di-tert-butyl-4-hydroxytoluene

Article 18 Prohibited (K-Reach Article 27) : None of the components are listed.

Article 19 Subject to authorization (K-Reach Article 25) : None of the components are listed.

Article 20 Restricted (K-Reach Article 27) : None of the components are listed.

Article 20 Toxic Chemicals (K-Reach Article 20) : Not applicable

Korea inventory : All components are listed or exempted.

Article 39 (Accident Precaution Chemicals) : None of the components are listed.

C. Dangerous Materials Safety Management Act : **Class:** Class 4 - Flammable Liquid
Item: 5. Class 3 petroleums - Water-insoluble liquid
Threshold: 2000 L
Danger category: III
Signal word: Contact with sources of ignition prohibited

D. Wastes regulation : Dispose of contents and container in accordance with all local, regional, national and international regulations.

E. Regulation according to other foreign laws

Safety, health and environmental regulations specific for the product : No known specific national and/or regional regulations applicable to this product (including its ingredients).

Section 16. Other information

A. References : Korean Ministry of Environment; Chemical Control Act
Korean Ministry of Labor; Industrial Safety and Health Act
NIER Notice
Registry of Toxic Effects of Chemical Substances (RTECS)
U.S. Environmental Protection Agency, AQUIRE (Aquatic toxicity Information Retrieval) ECOTOX Database System.

B. Date of issue/Date of revision : 2/23/2024

C. Version : 3.04

Section 16. Other information

Prepared by : EHS

D. Other

Indicates information that has changed from previously issued version.

Disclaimer

The information contained in this data sheet is based on present scientific and technical knowledge. The purpose of this information is to draw attention to the health and safety aspects concerning the products supplied by PPG, and to recommend precautionary measures for the storage and handling of the products. No warranty or guarantee is given in respect of the properties of the products. No liability can be accepted for any failure to observe the precautionary measures described in this data sheet or for any misuse of the products.