Safety Data Sheet (SDS)

North American (U.S. and Canada)

Revision date: 2018-06-19

SECTION 1: Identification

Product identifiers:

Product trade name: HYPRO* 2000X172 CTPB
Company product number: X172
Other means of identification: Not Available

Recommended use of the chemical and restrictions on use:

Uses: Binder for rocket fuel
Restrictions on use: None identified

Details of the supplier:

Manufacturer/Supplier:
Emerald Specialty Polymers, LLC
240 W Emerling Avenue
Akron, OH 44301
United States
Telephone: +1-856-533-3000
FAX: +1-856-533-3003

For further information about this SDS: Email: CTS.info@emeraldmaterials.com

Emergency telephone number:

ChemTel (24 hours): 1-800-255-3924 (USA); +1-813-248-0585 (outside USA); 1-300-954-583 (Australia); 000-800-100-4086 (India).

SECTION 2: Hazard(s) identification

Information in accordance with U.S. 29 CFR 1910.1200 (Hazcom 2012) and Canada Hazardous Products Regulations (WHMIS 2015):

Classification of the product:

Reproductive Toxicity, category 2

Label elements:

Hazard pictogram(s):

Signal word:
Warning

Hazard statements:
H361 Suspected of damaging fertility or the unborn child.

Precautionary statements:
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P308+P313 IF exposed or concerned: Get medical advice/attention.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local, regional and international regulations.

Supplemental information: No Additional Information

Precautionary statements are listed according to the United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS) - Annex III. Regulations in individual countries/regions may determine which statements are required on the product label. See product label for specifics.

Hazards not otherwise classified:

Physical hazards not otherwise classified: No Additional Information
Health hazards not otherwise classified: No Additional Information

See Section 11 for toxicological information.

SECTION 3: Composition/information on ingredients

Substance:

CAS-No.	Chemical Name	Weight%*
0000119-47-1	6,6'-Di-tert-butyl-2,2'-methylenedi-p-cresol	0.5-<1.5

Amounts specified are typical and do not represent a specification. Remaining components are proprietary, non-hazardous, and/or present at amounts below reportable limits. * Exact percentage values for components are proprietary (trade secret) in accordance with 29 CFR 1910.1200(i) and Hazardous Products Regulations 4.4.1.

SECTION 4: First-aid measures

Description of first aid measures:

General: If irritation or other symptoms occur or persist from any route of exposure, remove the affected individual from the area: see a physician/get medical attention.

Eye contact: Immediately flush eyes with plenty of clean water for an extended time, not less than fifteen (15) minutes. Flush longer if there is any indication of residual chemical in the eye. Ensure adequate flushing of the eyes by separating the eyelids with fingers and roll eyes in a circular motion. If eye irritation persists: Get medical advice/attention.

Skin contact: Immediately remove contaminated clothing and shoes. Wash the affected area with plenty of soap and water until no evidence of the chemical remains (at least 15-20 minutes). Launder clothing before reuse. If skin irritation occurs: Get medical advice/attention.

Inhalation: If affected, remove to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Call a POISON CENTER or doctor/physician if you feel unwell.

Ingestion: Do not induce vomiting. Never give anything by mouth to an unconscious person. Rinse out the mouth with water. Get medical attention immediately.

Protection of first aid responders: Wear proper personal protective clothing and equipment.

Most important symptoms and effects, both acute and delayed: Irritation. Pre-existing skin problems may be aggravated by prolonged or repeated contact. See section 11 for additional information.
Indication of any immediate medical attention and special treatment needed, if necessary: Treat symptomatically.

SECTION 5: Fire-fighting measures

NFPA flammability class: IIIB

Extinguishing media:

Suitable: NFPA Class IIIB (Combustible liquid): Use water spray, ABC dry chemical, foam or carbon dioxide. Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures.

Unsuitable: None known.

Special hazards arising from the chemical:

Unusual fire/explosion hazards: Product is not considered a fire hazard, but will burn if ignited. Hot vapor or mists may be susceptible to spontaneous combustion when mixed with air. Ignition temperatures decrease with increasing vapor volume and vapor/air contact time and are influenced by pressure changes. Therefore, ignition may occur below published ignition temperatures. Use of this product in processes involving elevated-temperatures, vacuum if subject to sudden ingress of air, sudden escape of vapor or mist, etc., must be thoroughly evaluated to assure safe operation. Closed container may rupture (due to build up in pressure) when exposed to extreme heat.

Hazardous combustion products: Irritating or toxic substances may be emitted upon burning, combustion or decomposition. See section 10 (Hazardous decomposition products) for additional information.

Special protective equipment and precautions for fire-fighters: Wear self-contained breathing apparatus (SCBA) equipped with a full facepiece and operated in a pressure-demand mode (or other positive pressure mode) and approved protective clothing. Personnel without suitable respiratory protection must leave the area to prevent significant exposure to hazardous gases from

combustion, burning or decomposition. In an enclosed or poorly ventilated area, wear SCBA during cleanup immediately after a fire as well as during the attack phase of firefighting operations.

See section 9 for additional information.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures: See Section 8 for recommendations on the use of personal protective equipment. If spilled in an enclosed area, ventilate. Eliminate ignition sources. Personal Protective Equipment must be worn.

Environmental precautions: Do not flush liquid into public sewer, water systems or surface waters.

Methods and materials for containment and cleaning up: Contain by diking with sand, earth or other non-combustible material. Wear proper personal protective clothing and equipment. Absorb spill with an inert material. Place into labeled, closed container; store in safe location to await disposal. Change contaminated clothing and launder before reuse. CAUTION: Spilled liquid and dried film are slippery. Use care to avoid falls.

SECTION 7: Handling and storage

Precautions for safe handling: As with any chemical product, use good laboratory/workplace procedures. Do not cut, puncture, or weld on or near the container. Wash thoroughly after handling this product. Always wash up before eating, smoking or using the facilities. Use under well-ventilated conditions. Avoid eye and skin contact. Avoid inhalation of aerosol, mist, spray, fume or vapor. Avoid drinking, tasting, swallowing or ingesting this product. Wash contaminated clothing before reuse. Provide eyewash fountains and safety showers in the work area.

Conditions for safe storage, including any incompatibilities: Store cool and dry, under well-ventilated conditions. Store this material away from incompatible substances (see section 10). Do not store in open, unlabeled or mislabeled containers. Keep container closed when not in use. Do not reuse empty container without commercial cleaning or reconditioning. Empty container contains residual product which may exhibit hazards of product. Store product where temperatures are below 122°F (50°C).

SECTION 8: Exposure controls / personal protection

Control parameters:

Occupational exposure limits (OEL):

Chemical Name	ACGIH - TWA/Ceiling		ACGIH - STEL	
6,6'-Di-tert-butyl-2,2'-methylenedi-p-cresol	N/E		N/E	
Chemical Name	**OSHA - PEL**	**OSHA - STEL**	**OSHA - Ceiling**	**AIHA - WEEL**
6,6'-Di-tert-butyl-2,2'-methylenedi-p-cresol	N/E	N/E	N/E	N/E

N/E=Not established (no exposure limits established for the listed substances for listed country/region/organization).

Exposure controls:

Appropriate engineering controls: Always provide effective general and, when necessary, local exhaust ventilation to draw spray, aerosol, fume, mist and vapor away from workers to prevent routine inhalation. Ventilation must be adequate to maintain the ambient workplace atmosphere below the exposure limit(s) outlined in the SDS. (Ventilation guidelines/techniques may be found in publications such as Industrial Ventilation: American Conference of Governmental Industrial Hygienists, 1330 Kemper Meadow Drive, Cincinnati, OH, 45240-1634, USA.) (http://www.acgih.org/home.htm).

Individual protection measures, such as personal protective equipment (PPE):

Eye/face protection: Safety glasses or goggles required.
Skin and body protection: Wear chemical resistant (impervious) gloves. Use good laboratory/workplace procedures including personal protective clothing: labcoat, safety glasses and protective gloves.
Respiratory protection: Wear an approved respirator (e.g., an organic vapor respirator, a full face air purifying respirator for organic vapors, or a self-contained breathing apparatus) whenever exposure to aerosol, mist, spray, fume or vapor exceed the applicable exposure limit(s) of any chemical substance listed in this SDS. Use respirator in accordance with manufacturer's use limitations and OSHA standard 1910.134 (29CFR).
Further information: Eyewash fountains and safety showers are recommended in the work area.

SECTION 9: Physical and chemical properties

Form:	Viscous liquid	**pH:**	Not Available
Appearance:	Caramel	**Relative density:**	0.91
Odor:	Slight	**Partition coefficient (n-octanol/water):**	Not Available
Odor threshold:	Not Available	**% Volatile by weight:**	<2 %
Solubility in water:	Negligible	**VOC:**	Not Available
Evaporation rate:	Non-volatile	**Boiling point °C:**	Not Available
Vapor pressure:	Not Available	**Boiling point °F:**	Not Available
Vapor density:	Not Available	**Flash point:**	180 °C (356 °F) Closed Cup
Viscosity:	60,000 cP @ 27 °C	**Auto-ignition temperature:**	Not Available
Melting point/Freezing point:	Not Available	**Flammability (solid, gas):**	Not Applicable (liquid)
Oxidizing properties:	Not oxidizing	**Flammability or explosive limits:**	**LFL/LEL** Not Available
Explosive properties:	Not explosive		**UFL/UEL** Not Available
Decomposition temperature:	Not Available		

Other information: Amounts specified are typical and do not represent a specification.

SECTION 10: Stability and reactivity

Reactivity: None known.

Chemical stability: This product is stable.

Possibility of hazardous reactions: Hazardous polymerization will not occur.

Conditions to avoid: Excessive heat and ignition sources.

Incompatible materials: Avoid contact with strong oxidizing agents and reducing agents. Depending on the amount and specific materials involved, contact can result in intense heat, boiling, flame development, explosion or toxic gas generation.

Hazardous decomposition products: Carbon dioxide, carbon monoxide and hydrocarbons.

SECTION 11: Toxicological information

Information on likely routes of exposure:

General: Caution must be exercised through the prudent use of protective equipment and handling procedures to minimize exposure. Health effects are particularly evident when product is heated.

Eyes: May cause eye irritation.

Skin: Repeated or prolonged skin contact may cause irritation.

Inhalation: Inhalation of fumes and vapors from processing, combustion or decomposition may cause irritation of the respiratory tract and mucous membranes.

Ingestion: Ingestion may cause irritation.

Symptoms/effects, acute and delayed: Irritation

Acute toxicity information: Not classified (based on available data, the classification criteria are not met). POLYMER: The high molecular weight of this polymer makes absorption by the body highly unlikely thus greatly diminishing the likelihood of toxic effects by the chemical itself.

Chemical Name	Inhalation LC50	Species	Oral LD50	Species	Dermal LD50	Species
6,6'-Di-tert-butyl-2,2'-methylenedi-p-cresol	>5 mg/L (4 hours)	Rat/ adult	4880 mg/kg	Rat/ adult	>5000 mg/kg	Rabbit/ adult

Skin corrosion/irritation: Not classified (based on available data, the classification criteria are not met).

Chemical Name	Skin irritation	Species

Chemical Name	Skin irritation	Species
6,6'-Di-tert-butyl-2,2'-methylenedi-p-cresol	Non-irritant	Rabbit/ adult

Serious eye damage/irritation: Not classified (based on available data, the classification criteria are not met).

Chemical Name	Eye irritation	Species
6,6'-Di-tert-butyl-2,2'-methylenedi-p-cresol	Slight irritant	Rabbit/ adult

Respiratory or skin sensitization: Not classified (no relevant information found).

Chemical Name	Skin sensitisation	Species
6,6'-Di-tert-butyl-2,2'-methylenedi-p-cresol	Non-sensitizer	Mouse/Local lymph node assay

Carcinogenicity: Not classified (no relevant information found).

Carcinogenic status: Not listed or regulated by IARC (Group 1 or 2), NTP, OSHA, or ACGIH.

Germ cell mutagenicity: Not classified (no relevant information found).

Reproductive toxicity: Suspected of damaging fertility or the unborn child (Category 2). 6,6'-DI-TERT-BUTYL-2,2'-METHYLENDI-P-CRESOL: Reproductive toxicity (oral, rats): NOAEL (no-observed adverse-effect-level), male rats=12.5 mg/kg bw/day; NOAEL, female rats=50 mg/kg bw.day. Some reproductive toxicity was seen in male rats (effects on sperm and histopathological changes in testes) during a repeated dose (oral) study.

Specific target organ toxicity (STOT) - single exposure: Not classified (no relevant information found).

Specific target organ toxicity (STOT) - repeated exposure: Not classified (no relevant information found).

Aspiration hazard: Not classified (based on available data, the classification criteria are not met).

Other toxicity information: No additional information available.

SECTION 12: Ecological information

Ecotoxicity: POLYMER: Freshwater Invertebrates Toxicity - the acute EC50 is expected to be >100 mg/L, based on similar materials; Algal Toxicity - the acute EC50 is expected to be >100 mg/L, based on similar materials. 6,6'-DI-TERT-BUTYL-2,2'-METHYLENDI-P-CRESOL: Acute toxicity is not expected at or below the level of water solubility.

Chemical Name	Fish 96 hour LC50	Fish 96 hour LC50	Fish Chronic NOEC
6,6'-Di-tert-butyl-2,2'-methylenedi-p-cresol	>5 mg/L	N/E	N/E

Chemical Name	Invertebrates 48 hour EC50	Invertebrates 24 hour EC50	Invertebrates Chronic NOEC
6,6'-Di-tert-butyl-2,2'-methylenedi-p-cresol	>4.8 mg/L	N/E	N/E

Chemical Name	Algae 96 hour EC50	Algae 72 hour EC50	Algae Chronic NOEC
6,6'-Di-tert-butyl-2,2'-methylenedi-p-cresol	N/E	>5 mg/L	1.3 mg/L (72 hours)

Persistence and degradability: Not expected to biodegrade.

Chemical Name	Biodegradation
6,6'-Di-tert-butyl-2,2'-methylenedi-p-cresol	Not readily biodegradable (OECD 301C)

Bioaccumulative potential: No specific information available.

Chemical Name	Bioconcentration Factor (BCF)	Log Kow
6,6'-Di-tert-butyl-2,2'-methylenedi-p-cresol	840	6.25

Mobility in soil: No specific information available.

Chemical Name	Mobility in soil (Koc/Kow)
6,6'-Di-tert-butyl-2,2'-methylenedi-p-cresol	N/E

Other adverse effects: No additional information available.

SECTION 13: Disposal considerations

For waste disposal purposes, this product is not known to be defined or designated as hazardous by current provisions of the Federal (EPA) Resource Conservation and Recovery Act (RCRA, 40CFR261). Incinerate waste product when in liquid form (i.e., as supplied) in a properly permitted (approved) incineration facility in accordance with federal, state and local regulations. Liquids cannot be disposed of in a landfill. Federal, state and local regulations where the waste material is generated, treated, and/or disposed of must be examined to verify the appropriate waste classification. Incinerate waste product when in liquid form (i.e., as supplied) in a properly permitted (approved) incineration facility in accordance with federal, state and local regulations. Liquids

cannot be disposed of in a landfill.

See Section 8 for recommendations on the use of personal protective equipment.

SECTION 14: Transport information

The information below is provided to assist in documentation. It may supplement the information on the package. The package in your possession may carry a different version of the label depending on the date of manufacture. Depending on inner packaging quantities and packaging instructions, it may be subject to specific regulatory exceptions.

UN number: N/A

UN proper shipping name:

Not regulated - See Bill of Lading for Details

Transport hazard class(es):

U.S. DOT hazard class: N/A
Canada TDG hazard class: N/A
Europe ADR/RID hazard class: N/A
IMDG Code (ocean) hazard class: N/A
ICAO/IATA (air) hazard class: N/A

A "N/A" listing for the hazard class indicates the product is not regulated for transport by that regulation.

Packing group: N/A

Environmental hazards:

Marine pollutant: Not Applicable
Hazardous substance (USA): Not Applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code:

Not Applicable

Special precautions for user: Not Applicable

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question:

U.S. federal and state regulations/legislation:

This SDS has been prepared in accordance with the hazard criteria of the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

U.S. Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Reportable Quantity (RQ):

Not Applicable

U.S. Superfund Amendments and Reauthorization Act (SARA) - 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 40 CFR 372:

None known

U.S. TSCA Section 12(b) Export Notification:

This product is not subject to TSCA 12(b) reporting requirements.

California Proposition 65:

The following ingredient(s) present in the product is [are] known to the State of California to cause cancer:

None known to be present or none in reportable amounts for occupational exposure as per OSHA's approval of the California Hazard Communication Standard, Federal Register, page 31159 ff, 6 June 1997.

The following ingredient(s) present in the product is [are] known to the State of California to cause birth defects or other reproductive harm:

None known to be present or none in reportable amounts for occupational exposure as per OSHA's approval of the California Hazard Communication Standard, Federal Register, page 31159 ff, 6 June 1997.

Notes: This product is specifically controlled by U.S. Export Administration Regulations under Export Control Classification

Number (ECCN) 1C111. A validated U.S. Export License is required to export this product.

Canada regulations/legislation:

This product has been classified in accordance with the hazard criteria of the Hazardous Products Regulations and the SDS contains all the information required by the Hazardous Products Regulations.

Notes: Canadian DSL: One or more components of this product are not on the Canadian Domestic Substances List (DSL) or the Non-Domestic Substances List (NDSL).

Chemical inventories:

Regulation	Status
Australian Inventory of Chemical Substances (AICS):	N
Canadian Domestic Substances List (DSL):	N
Canadian Non-Domestic Substances List (NDSL):	N
China Inventory of Existing Chemical Substances (IECSC):	N
European EC Inventory (EINECS, ELINCS, NLP):	Y
Japan Existing and New Chemical Substances (ENCS):	N
Japan Industrial Safety and Health Law (ISHL):	N
Korean Existing and Evaluated Chemical Substances (KECL):	N
New Zealand Inventory of Chemicals (NZIoC):	N
Philippines Inventory of Chemicals and Chemical Substances (PICCS):	N
Taiwan Inventory of Existing Chemicals:	N
U.S. Toxic Substances Control Act (TSCA):	Y

Europe REACh (EC) 1907/2006: This product is considered a polymer under Regulation (EC) 1907/2006 and is exempt from the requirement for registration. One or more applicable monomers/other reactants are not registered. Please contact your sales representative for further information regarding REACh compliance. REACh is only relevant to substances either manufactured or imported into the EU. REACh information regarding this product is provided for informational purposes only. Each Legal Entity may have differing REACh obligations, depending on their place in the supply chain. For material manufactured outside of the EU, the importer of record must understand and meet their specific obligations under the regulation.

SECTION 16: Other information

SDS Revision date: 2018-06-19

HMIS (Hazardous Materials Identification System) Ratings:

Health: 1* **Flammability:** 1 **Physical hazard:** 0 **Personal Protection:** X

NFPA (National Fire Protection Association) Ratings:

Health: 1 **Flammability:** 1 **Instability:** 0

Key: 0=Insignificant; 1=Slight; 2=Moderate; 3=High; 4=Extreme. An asterisk appearing after the HMIS Health numerical rating denotes a chronic hazard.

Hazardous Materials Identification System (HMIS), National Paint and Coating Association, rating applies to product "as packaged" (i.e., ambient temperature). Ratings are based upon HMIS® III and NFPA 704 (2007). An asterisk appearing after the HMIS Health® III numerical rating denotes a chronic hazard. National Fire Protection Association (NFPA) rating identifies the severity of hazards of material during a fire emergency (i.e., "on fire").

Legend:

* : Trademark owned by Emerald Specialty Polymers, LLC.
ACGIH: American Conference of Governmental Industrial Hygienists
AIHA WEEL: American Industrial Hygiene Association (AIHA) Workplace Environmental Exposure Level (WEEL)
N/A: Not Applicable
N/E: None Established
STEL: Short Term Exposure Limit
TWA: Time Weighted Average (exposure for 8-hour workday)

Users Responsibility/Disclaimer of Liability:

As the conditions or methods of use are beyond our control, we do not assume any responsibility and expressly disclaim any liability for any use of this product. Information contained herein is believed to be true and accurate but all statements or suggestions are made without warranty, expressed or implied, regarding accuracy of the information, the hazards connected with the use of the material or the results to be obtained from the use thereof. Compliance with all applicable federal, state, and local laws and local regulations remains the responsibility of the user.

This bulletin cannot cover all possible situations which the user may experience during processing. Each aspect of your operation should be examined to determine if, or where, additional precautions may be necessary. All health and safety information contained in this bulletin should be provided to your employees or customers. It is your responsibility to develop appropriate work practice guidelines and employee instructional programs for your operation.

Safety Data Sheet Preparer:
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1499 SE Tech Center Place, Suite 300
Vancouver, WA 98683
United States