PRODUCT INFORMATION & HANDLING GUIDE

PCL®
HEXACHLOROCYCLOPENTADIENE

VELSICOL CHEMICAL LLC

Version 4, Revision 03/24/2025

Intermediate for agricultural (pesticides and fungicides) and flame retardants applications.

SPECIFICATIONS

Assay, % min	98.5
Iron, ppm, max	3
Color, Gardner, max	6
Chlorides, ppm, max	10

PHYSICAL and CHEMICAL PROPERTIES

Appearance	Dense, oily liquid
Boiling point @ 753mm Hg	239˚C (462.2˚F)
Color	Pale yellow
Freeze Point	10˚C (50.0˚F)
Molecular formula	C_5Cl_6
Molecular weight	273 (272.77)
Odor	Sharp musty odor
Specific gravity @ 25˚C	1.702
Vapor density @ 25˚C	9.42
Vapor pressure, mm HG @ 20˚C	NDA

SOLUBILITIES

At 25˚C, hexachlorocyclopentadiene (HCCP) is soluble in acetone, carbon tetrachloride, ethanol, hexane and other organic solvents. HCCP has low solubility (1.8mg/L) in water.

HAZARDS

FIRE: HCCP is a non-flammable liquid. Contact with sodium may cause explosion. In case of fire, use dry chemicals, carbon dioxide, water spray or foam. Firefighters should wear self-contained breathing apparatus and full protective clothing. Drums should be wet down with water and removed from area of fire at the first opportunity. Equipment should be thoroughly decontaminated after use.

HEALTH: Results of laboratory studies with animals indicate that HCCP is an extremely irritating and corrosive substance to the eye. Contact with eyes may result in eye injury or permanent damage. Studies also revealed that HCCP is highly toxic through inhalation and can be absorbed through the skin to produce toxic effects.

HCCP is considered as a primary skin irritant. The product may produce an allergic reaction in some humans, according to the results of a dermal sensitizing study with guinea pigs.

PRECAUTIONS FOR NORMAL USE

In operations employing basic, sound industrial hygiene practices, acute effects from over-exposure to HCCP are not likely to occur.

To avoid adverse health effects from chronic over-exposure, the following specific practices should be employed:

A. The toxicity information, signs of over-exposure, handling precautions and use of personal protective equipment should be reviewed with each employee engaged in the manufacture or handling of HCCP.
B. Employees should be required to shower if a spill or leak has caused gross contamination of work clothes or body surfaces. All employees are encouraged to shower at the end of each work shift.
C. Eating, drinking and smoking should be prohibited in the production area and employees should be instructed to thoroughly wash all exposed skin surfaces prior to these activities. No food, drink or tobacco products should be stored or carried in the production area.

PERSONAL PROTECTIVE EQUIPMENT

The recommended personal protective equipment shown below should be worn when handling this material unless deemed unnecessary by an industrial hygienist. Inhalation and skin contact are expected to be the primary routes of occupational exposure to HCCP.

	Eyes	Skin	Respiratory
Closed Systems:	Chemical splash goggles	Coveralls, impervious gloves, boots	None
Routine Handling:	Eye protection is provided by facepiece respirator	Coveralls, impervious gloves, boots	Full facepiece approved organic vapor respirator
Gross Contact Possible:	Eye protection is provided by facepiece respirator	Coveralls, impervious gloves, boots	Full facepiece air-supplied respirator

TERMS

Closed Systems: Bulk handling and storage, continuous reactors, etc. in well-ventilated areas.

Routine Handling: Operations requiring open weighing, transferring and routine manufacturing and packaging.

Gross Contact Possible: Non-routine hand operations, emergency repairs, spills and temporary ventilation failure.

EXPOSURE LIMIT

The Threshold Limit Value (TLV) of 0.01 ppm (approximately 0.1 mg/M^3) was recommended by the American Conference of Governmental Industrial Hygienists (ACGIH).

Signs of over-exposure to HCCP may cause one or more of the following symptoms:

Severe eye irritation	Marked skin irritation
Tearing	Salivation
Difficulty breathing	

RESULTS OF TOXICITY STUDIES

For a listing of adverse effects observed during studies, please refer to the Supplemental Toxicity Information Bulletin.

Ingestion: Acute oral toxicity studies with rats indicated that HCCP is "moderately toxic" through ingestion (LD_{50} = 584 mg/kg). [Based on Hodge-Sterner's Acute Toxicity Scale.]

Eye: Results of a primary eye irritation study with rabbits indicated that HCCP is extremely irritating and corrosive to the eye. It may also produce systemic toxic effects via this exposure route. Due to the toxicity of the substance, all test animals died during the study.

Dermal: Results of an acute dermal toxicity study with rabbits indicated that HCCP can be absorbed through the skin to produce toxic effects (LD_{50} <200). HCCP is classified as a primary skin irritant (irritation score 6.1/8.0) based n the results of a primary skin irritation study with rabbits. A dermal sensitization study with guinea pigs revealed that HCCP may cause an allergic reaction in some humans.

Inhalation: HCCP is toxic through inhalation, according to the results of an acute inhalation study (LD_{50} <2 mg/M^3) with rabbits. Test animals showed signs of respiratory tract irritation.

Other: Mutagenicity testing results were negative for HCCP. In teratology studies, HCCP treated animals displayed development similar to those in the control group.

FIRST AID

Ingestion: If swallowed, DO NOT induce vomiting. If conscious, drink several glasses of water or milk. Never give anything by mouth to an unconscious person. Get prompt medical attention.

Eye: Immediately flush eyes with plenty of water for at least 15 minutes. Get prompt medical attention.

Dermal: Flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Get prompt medical attention.

Inhalation: POISON. Call a poison control center. If overcome, remove worker to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get prompt medical attention.

HCCP HANDLING, TRANSFER & STORAGE

The handling and storage of HCCP requires special consideration in the selection of equipment materials of construction and compliance with U.S. Department of Transportation hazardous material transportation regulations (for transport). Between the temperatures of 10°C and 50°C HCCP can be satisfactorily handled in 316SS and several types of plastic resin coated carbon steel.

Piping and Valves: 316SS pipe with welded and flanged joints is the material of choice. 316SS ball or plug valves with Teflon seat and seals are recommended. The preferred gasket material for HCCP service is Garlock 7705

Pumps & Seals: 316SS centrifugal pumps or 316SS mag-drive seal-less pumps are recommended for HCCP service.

Storage – Tank: HCCP is stored in lined steel storage tanks. The recommended lining for large storage tanks is Coroline 505 series multi-layered modified epoxy lining with glass cloth reinforcing.

Shelf Life: Three years from analysis date. Product may be re-analysed to extend shelf life.

Temperature controls are necessary on HCCP storage to maintain the HCCP temperature above its freezing point of 10°C.

Nitrogen padding must be used on HCCP storage tanks to prevent the gradual air oxidation of the HCCP and resulting loss of assay. All HCCP storage should be located within secure, diked, spill containment pads.

REGULATORY INFORMATION

Europe

EINECS Status	Listed, Hexachlorocyclopentadiene EC # 201-029-3
EU Classification for Dangerous Preparation Directive	Annex I Index # 602-078-00-7

Americas

U.S. TSCA Inventory	Listed, 1,3-cyclopentadiene,1,2,3,4,5,5-hexanchloro CASRN 77-47-4
Canadian DSL	Listed

Pacific Rim

Australian Inventory AICS	Listed
Japan MITI/MHW Chemical Substances Control Inventory for Existing and New Chemical Substances	Listed, ENCS # (3)-2253
South Korean Existing Chemicals List	Listed, Korean Gazette # KE-18409
Philippines Inventory (PICCS)	Listed
Chinese Inventory (Draft)	Listed, Chinese Section #: III

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