



Material Safety Data Sheet

Pentane

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Pentane

OTHER/GENERIC NAMES: n-Pentane

PRODUCT USE: Solvent

MANUFACTURER: Honeywell
1953 South Harvey Street
Muskegon, MI 49442

DISTRIBUTOR: VWR International
1310 Goshen Parkway
West Chester, PA 19380

FOR MORE INFORMATION CALL:
(Monday-Friday, 8:00am-5:00pm)
1-800-932-5000

IN CASE OF EMERGENCY CALL:
(24 Hours/Day, 7 Days/Week)
1-800-424-9300 (USA Only)
For Transportation Emergencies:
1-800-424-9300 (CHEMTREC - Domestic)
1-613-996-6666(CANUTEC- Canada)

NOTE: Emergency telephone numbers are to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure, or accident involving chemicals. All non-emergency questions should be directed to customer service.

2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>WEIGHT %</u>
Pentane	109-66-0	100

This product is not considered to be hazardous according to the criteria specified in 29 CFR 1910.1200 (Hazard Communication Standard) and the Canadian Controlled Product Regulations.

Trace impurities and additional material names not listed above may also appear in Section 15 toward the end of the MSDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: This product is a clear, volatile, flammable liquid. Has a mild hydrocarbon odor. Extremely flammable. Vapours may form explosive mixtures with air. The product causes irritation of eyes, skin and mucous membranes. Harmful by inhalation and if swallowed. Repeated exposure may cause skin dryness or cracking. Harmful: may cause lung damage if swallowed. Causes headache, drowsiness or other effects to the central nervous system. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. Do not allow product to contact skin, eyes and clothing. Do not breathe vapours.



MATERIAL SAFETY DATA SHEET

Pentane

POTENTIAL HEALTH HAZARDS

SKIN: Irritating to skin. Repeated or extended contact may cause erythema (reddening of the skin) or dermatitis, resulting from a defatting action on tissue.

EYES: Irritating to eyes. Symptoms include itching, burning, redness and tearing.

INHALATION: Vapours may cause drowsiness and dizziness. Inhalation of high vapour concentrations can cause CNS-depression and narcosis. Severe overexposure may produce more serious symptoms, including coma and risk of kidney damage.

INGESTION: Harmful: may cause lung damage if swallowed. Ingestion of this product may result in central nervous system effects including headache, sleepiness, dizziness, slurred speech and blurred vision. Severe overexposure may produce more serious symptoms, including coma and risk of kidney damage.

DELAYED EFFECTS: Repeated or prolonged exposure may cause damage to the central nervous system, liver and kidney.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Pre-existing liver or kidney dysfunctions, or respiratory or central nervous system disorders may be aggravated by exposure.

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

<u>INGREDIENT NAME</u>	<u>NTP STATUS</u>	<u>IARC STATUS</u>	<u>OSHA LIST</u>
No component of this product at levels greater than or equal to 0.1% is identified as a carcinogen by ACGIH, IARC, NTP or OSHA.			

HMIS Ratings: Health: 2 Fire: 4 Physical Hazard: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard

4. FIRST AID MEASURES

SKIN: Wash off immediately with soap and plenty of water. Take off contaminated clothing and shoes immediately. Wash contaminated clothing before re-use. Obtain medical attention.

EYES: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.

INHALATION: Move to fresh air in case of accidental inhalation of vapours. If not breathing, give artificial respiration. If breathing is difficult, give oxygen, provided a qualified operator is available. Call a physician immediately.

INGESTION: DO NOT induce vomiting. Immediate medical attention is required. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration.



MATERIAL SAFETY DATA SHEET

Pentane

ADVICE TO PHYSICIAN: Treat symptomatically.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT: -56.2°F (-49°C)
FLASH POINT METHOD: TAG Closed Cup
AUTOIGNITION TEMPERATURE: 564.8°F (296°C)
UPPER FLAME LIMIT (volume % in air): 7.8
LOWER FLAME LIMIT (volume % in air): 1.5
FLAME PROPAGATION RATE (solids): Not applicable
OSHA FLAMMABILITY CLASS: Class 1A Flammable Liquid

EXTINGUISHING MEDIA:

Use regular foam, carbon dioxide (CO₂) or dry chemical.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Extremely flammable. Vapours may form explosive mixtures with air. Vapours are heavier than air and may travel along the ground to some distant source of ignition and flash back.

Hazardous combustion products may include carbon monoxide, carbon dioxide (CO₂).

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

Water may be ineffective. Do not use a solid water stream as it may scatter and spread fire. Suppress (knock down) gases/vapours/mists with a water spray jet. Fire or intense heat may cause violent rupture of packages. Fire-fighters should wear self-contained, NIOSH-approved breathing apparatus and full protective clothing. In the event of fire, cool tanks with water spray. Do not allow run-off from fire fighting to enter drains or water courses.

NFPA Ratings: Health: 2 Fire: 4 Reactivity: 0

Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE:

Containment Procedures: Use personal protective equipment. Ensure adequate ventilation. Remove all sources of ignition. Stop flow of material, if this is without risk.

Cleanup Procedures: Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust). Shovel into suitable container for disposal. Do not use sparking tools. Do not allow product to enter sewer or waterways.

Evacuation Procedures: Keep unnecessary people away. Isolate area.

Special Procedures: Use personal protective equipment.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.



MATERIAL SAFETY DATA SHEET

Pentane

7. HANDLING AND STORAGE

NORMAL HANDLING: (Always wear recommended personal protective equipment.)

Extremely flammable -- ensure all equipment is electrically grounded before beginning transfer operations. Use common bonding techniques. Ensure adequate ventilation. Avoid contact with skin, eyes and clothing. Do not breathe vapours. Keep away from fire, sparks and heated surfaces.

STORAGE RECOMMENDATIONS:

Keep in a well-ventilated place. Empty containers may retain product residue including flammable or explosive vapours. Do not cut, drill, grind, or weld near full, partially full, or empty product containers. Keep away from heat and sources of ignition. Store away from incompatible substances. Re-open used containers with caution. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Store in area designed for storage of flammable liquids. Protect from physical damage. Protect from extremes of temperature and direct sunlight.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

Provide local and general exhaust ventilation to effectively remove and prevent buildup of any vapours or mists generated from the handling of this product or use product in closed system. Local exhaust ventilation is preferred. Prevent electrostatic charge build-up by using common bonding and grounding techniques.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION:

Wear impervious gloves and flame retardant antistatic protective clothing. Gloves must be inspected prior to use. For leak, spills, or other emergency, use full protective equipment.

EYE PROTECTION:

For handling in closed ventilation system, wear safety glasses with side-shields. For leak, spill or other emergency, use chemical goggles and face-shield. Remove contact lenses.

RESPIRATORY PROTECTION:

When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. For emergency or non-routine operations, wear self contained breathing apparatus.

ADDITIONAL RECOMMENDATIONS:

Provide eyewash stations and quick-drench shower facilities. High standards of skin care and personal hygiene should be exercised at all times.

EXPOSURE GUIDELINES

Component Exposure Limits

Pentane (109-66-0)

ACGIH:	600 ppm TWA
OSHA (Final):	1000 ppm TWA; 2950 mg/m ³ TWA
OSHA (Vacated):	600 ppm TWA; 1800 mg/m ³ TWA 750 ppm STEL; 2250 mg/m ³ STEL



MATERIAL SAFETY DATA SHEET

Pentane

NIOSH:	120 ppm TWA; 350 mg/m ³ TWA 610 ppm Ceiling (15 min); 1800 mg/m ³ Ceiling (15 min)
Alberta:	600 ppm TWA; 1770 mg/m ³ TWA
British Columbia:	600 ppm TWA
Manitoba:	600 ppm TWA; 1800 mg/m ³ TWA 750 ppm STEL; 2250 mg/m ³ STEL
New Brunswick:	600 ppm TWA; 1770 mg/m ³ TWA 750 ppm STEL; 2210 mg/m ³ STEL
Northwest Territories:	600 ppm TWA; 1771 mg/m ³ TWA 750 ppm STEL; 2213 mg/m ³ STEL
Nova Scotia:	600 ppm TWA
Nunavut:	600 ppm TWA; 1771 mg/m ³ TWA 750 ppm STEL; 2213 mg/m ³ STEL
Ontario:	600 ppm TWAEV; 1770 mg/m ³ TWAEV 750 ppm STEV; 2210 mg/m ³ STEV
Quebec:	120 ppm TWAEV; 350 mg/m ³ TWAEV
Saskatchewan:	1770 mg/m ³ TWA; 600 ppm TWA 2210 mg/m ³ STEL; 750 ppm STEL
Yukon:	600 ppm TWA; 1800 mg/m ³ TWA 750 ppm STEL; 2250 mg/m ³ STEL

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Clear, colorless liquid
PHYSICAL STATE:	Liquid
MOLECULAR WEIGHT:	72.17
CHEMICAL FORMULA:	C ₅ H ₁₂
ODOR:	Mild hydrocarbon
SPECIFIC GRAVITY (water = 1.0):	0.626 @ 68°F (20°C)
SOLUBILITY IN WATER (weight %):	0.04 @ 68°F (20°C)
pH:	Not applicable
BOILING POINT:	96.8°F (36°C) @ 760 mm Hg
MELTING POINT:	-201.5°F (-129.7°C)
VAPOUR PRESSURE:	420 mm Hg @ 68°F (20°C)
VAPOUR DENSITY (air = 1.0):	2.5
EVAPORATION RATE:	~29
% VOLATILES:	~100
FLASH POINT:	-56.2°F (-49°C)
COMPARED TO:	Butyl Acetate = 1

(Flash point method and additional flammability data are found in Section 5.)

10. STABILITY AND REACTIVITY

NORMALLY STABLE? (CONDITIONS TO AVOID):

Stable under recommended storage conditions.

Avoid: Heat, flames and sparks. Incompatible products



MATERIAL SAFETY DATA SHEET

Pentane

INCOMPATIBILITIES:

Avoid strong oxidizers, strong acids, amines and strong bases.

HAZARDOUS DECOMPOSITION PRODUCTS:

Hazardous decomposition products include carbon monoxide and carbon dioxide (CO₂).

HAZARDOUS POLYMERISATION:

Hazardous polymerisation does not occur.

11. TOXICOLOGICAL INFORMATION

Component Analysis - LD50/LC50

Pentane (109-66-0)

Rat: LD50 - Route: Inhalation; Dose: 364 g/m³/4H

Rabbit: LD50 - Route: Dermal; Dose: 3000 mg/kg

IMMEDIATE (ACUTE) EFFECTS:

The product causes irritation of eyes, skin and mucous membranes. Harmful by inhalation and if swallowed. Harmful: may cause lung damage if swallowed. Causes headache, drowsiness or other effects to the central nervous system.

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

Repeated exposure may cause skin dryness or cracking. Repeated or prolonged exposure may cause damage to the central nervous system, liver and kidney.

90-Day Inhalation Toxicity Test (rat): Four groups of 20 rats were exposed to concentrations of 0, 5,000, 10,000, or 20,000 mg/m³, respectively, 6h/day, 5 days/week for 13 weeks. A NOAEL was determined to be 20,000 mg/m³ (7,000 ppm).

Oral Developmental Toxicity Study (rat): No maternal or fetal developmental effects were produced when confirmed-mated females were dosed orally once per day with n-pentane in corn oil up to a dose level of 1,000 mg/kg from gestation days 6 through 15.

Inhalation Developmental Toxicity Study (rat): No maternal or fetal developmental effects were produced when pregnant rats were exposed to n-pentane concentrations up to 10,000 ppm (~28,600 mg/m³) 6 h/day from gestation days 6 through 15.

In Vivo Mammalian Bone Marrow Micronucleus Test (rat): No statistically significant increase in micronucleus formation or cytotoxicity in the bone marrow was produced in animals exposed by inhalation to n-pentane at levels up to 20,000 mg/m³ 6 h/day, 5 days/week for a period of 90 days.

OTHER DATA:

This material is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP, or EPA.



MATERIAL SAFETY DATA SHEET

Pentane

12. ECOLOGICAL INFORMATION

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Component Analysis - Ecotoxicity - Aquatic Toxicity

Pentane (109-66-0)

Test & Species	Conditions
96 Hr LC50 rainbow trout	9.87 mg/L
96 Hr LC50 fathead minnow	11.59 mg/L
96 Hr LC50 bluegill	9.99 mg/L
48 Hr LC50 water flea	9.7 mg/L

Does not bioaccumulate. Not readily biodegradable.

13. DISPOSAL CONSIDERATIONS

WASTE INFORMATION: This product is a D001 ignitable waste in supplied form. Dispose of as special waste in compliance with local and national regulations. Waste codes should be assigned by the user based on the application for which the product was used. Incineration of waste material in an EPA-approved facility is recommended, allowing a solid, inert residue to form.

OTHER DISPOSAL CONSIDERATIONS: Observe all Federal, State, and Local Environmental regulations.

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

14. TRANSPORT INFORMATION

US DOT PROPER SHIPPING NAME: Pentanes

US DOT HAZARD CLASS: 3

US DOT ID NUMBER: UN1265

PACKING GROUP: II

TDG PROPER SHIPPING NAME: Pentanes, liquid

TDG HAZARD CLASS: 3

TDG ID NUMBER: UN1265

PACKING GROUP: II

North American Emergency Response Guide (ERG) Number: 128.

For additional information on shipping regulations affecting this material, contact the information number found in Section 1.



MATERIAL SAFETY DATA SHEET

Pentane

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)

TSCA INVENTORY STATUS: All components are on the U.S. EPA TSCA Inventory List.

OTHER TSCA ISSUES: TSCA (Toxic Substances Control Act) - Section 4 - Chemical Test Rules (40 CFR 799)
TSCA Section 8(a) Preliminary Assessment Information Rule (PAIR) (40 CFR 712, Subpt. B)
TSCA (Toxic Substances Control Act) - Section 8(a) - PAIR - Reporting List
TSCA High Production Volume (HPV) Chemicals: 1990, 1994 & Post-1994 Additions (01/31/05)
TSCA 12(b): This product contains a chemical or chemicals that require Export Notification.

Additional TSCA information may exist. Contact VWR if you have questions regarding your application or use of this product.

SARA TITLE III/CERCLA

"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

<u>INGREDIENT NAME</u>	<u>SARA/CERCLA RQ (lb)</u>	<u>SARA EHS TPQ (lb)</u>
No ingredients listed in this section.	None	None

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center [(800) 424-8802] and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS: Immediate. Fire.

SARA 313 TOXIC CHEMICALS:

The following ingredients are SARA 313 "Toxic Chemicals". CAS numbers and weight percents are found in Section 2.

<u>INGREDIENT NAME</u>	<u>COMMENT</u>
No ingredients listed in this section.	None

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

<u>INGREDIENT NAME</u>	<u>WEIGHT %</u>	<u>COMMENT</u>
Pentane (109-66-0)	100	CA, MA, MN, NJ, PA, RI

ADDITIONAL REGULATORY INFORMATION:

None.



MATERIAL SAFETY DATA SHEET

Pentane

WHMIS CLASSIFICATION (CANADA):

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all information required by CPR.

WHMIS Classification:

B2- Flammable Liquid

D2B- Toxic Material

FOREIGN INVENTORY STATUS:

Component Analysis - Inventory

Component	CAS #	TSCA	CAN	EEC	AUST	PHIL	MITI	KOREA	CHINA
Pentane	109-66-0	Yes	DSL	EINECS	Yes	Yes	Yes	Yes	Yes

16. OTHER INFORMATION

CURRENT ISSUE DATE: February 9, 2006

PREVIOUS ISSUE DATE: New MSDS.

CHANGES TO MSDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:

New MSDS.

OTHER INFORMATION: As per the OSHA Hazard Communication Standard, 1910.1200, the information contained within this MSDS must be given to those persons using this material. For laboratory use only. Not for food or drug use. Do not store with foodstuffs.

KEY/LEGEND: ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; CFR = Code of Federal Regulations; CPR = Controlled Products Regulations; DOT = Department of Transportation; DSL = Domestic Substances List; EINECS = European Inventory of Existing Commercial Chemical Substances; EPA = Environmental Protection Agency; IARC = International Agency for Research on Cancer; IATA = International Air Transport Association; mg/Kg = milligrams per Kilogram; mg/L = milligrams per Liter; mg/m³ = milligrams per Cubic Meter; MSHA = Mine Safety and Health Administration; NA = Not Applicable or Not Available; NIOSH = National Institute for Occupational Safety and Health; NJTSR = New Jersey Trade Secret Registry; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; SARA = Superfund Amendments and Reauthorization Act; TDG = Transport Dangerous Goods; TSCA = Toxic Substances Control Act; WHMIS = Workplace Hazardous Materials Information System.

End of Sheet #BDH-370