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24 HOUR EMERGENCY NUMBER (CHEMTREC)
USA: 800-424-9300
International: 703-527-3887

All non-emergency numbers should be directed to Tedia Customer Service at 800-PURITY1

SAFETY DATA SHEET

n-Pentane

SDS No. M0165

Distributed by:
Rocky Mountain Reagents
SCIENTIFIC SOLUTIONS SINCE 1951
4621 Technology Drive, Golden, CO 80403
ph: (303) 762-0800 fax: (303) 762-1240
Product #: P1136, P1137

1 IDENTIFICATION

1.1 Product Identifier:
Chemical Name: n-Pentane
Synonyms: Pentane, Amyl hydride, Skellysolve A
CAS No.: 109-66-0

1.2 Recommended Use and Restrictions:
Use: Laboratory research, analytical applications, and industrial manufacturing. Suitable for use as a solvent in chemical synthesis, cleaning, or processing.
Restrictions: Not for use in food, drugs, cosmetics, medical devices, or household consumer products unless explicitly certified.
Regulatory Note: This product may be subject to TSCA requirements. For commercial/industrial use in the United States, the buyer is responsible for verifying TSCA compliance. Laboratory users should confirm appropriate exemptions apply to their research use.

1.3 Supplier:
Tedia Company LLC, 1000 Tedia Way, Fairfield, Ohio 45014 USA
Phone: 513-874-5340 | Website: www.tedia.com

1.4 Emergency Phone Number:
CHEMTREC (USA): 800-424-9300
CHEMTREC (International): +1-703-527-3887

2 HAZARD IDENTIFICATION

2.1 Classification of the Substance/Mixture
GHS Classification:
Flammable Liquids (Category 1B), H225
Aspiration Hazard (Category 1), H304
Specific Target Organ Toxicity – Single Exposure (Category 3), H336 (narcotic effects)
Hazardous to Aquatic Environment (Category 2), H411

2.2 GHS Label Elements
Hazard Pictograms:



Signal Word: DANGER

Hazard Statements:
H225: Highly flammable liquid and vapor.
H304: May be fatal if swallowed and enters airways.
H336: May cause drowsiness or dizziness.
H411: Toxic to aquatic life with long-lasting effects.

Precautionary Statements:
P210: Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P233: Keep container tightly closed.
P240: Ground/bond container and receiving equipment.
P241: Use explosion-proof electrical/ventilating/lighting equipment.
P242: Use only non-sparking tools.
P243: Take precautionary measures against static discharge.
P264: Wash skin thoroughly after handling.
P280: Wear protective gloves/eye protection/face protection.
P303+P361+P353: IF ON SKIN: Remove contaminated clothing. Rinse skin with water/shower.
P304+P340: IF INHALED: Remove to fresh air and keep at rest.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for 15 minutes.
P337+P313: If eye irritation persists: Get medical advice.
P403+P235: Store in a well-ventilated place. Keep cool.
P501: Dispose of contents/container to hazardous waste facility.

2.3 Other Hazards
Highly flammable (flash point: −49°C/−56°F; auto-ignition: 260°C/500°F).
Vapors heavier than air (vapor density: 2.48) – may accumulate in low areas.

2.4 Emergency Overview
Highly flammable liquid/vapor.
May cause narcotic effects including drowsiness or dizziness (CNS depression).
Harmful to aquatic animals.

2.5 HMIS Rating:
Health – 2 Flammability – 4 Physical Hazard – 0 PPE – F (Gloves, goggles, respirator)
NOTE: HMIS ratings (0–4) reflect hazard severity under normal use. Higher values indicate greater risk. PPE recommendations are minimal; users must assess specific conditions.

3 COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance Identification
Chemical Name: n-Pentane

Hazardous	Ingredient	CAS No.	EC No.	Concentration	Molecular Formula
Yes	n-Pentane	109-66-0	203-692-4	100%	C_5H_{12}

4 FIRST AID MEASURES

4.1 Description of First Aid Measures

Inhalation:
Immediately move victim to fresh air. Keep at rest in a position comfortable for breathing. Administer 100% oxygen by trained personnel if breathing is difficult. If unconscious, place in recovery position and seek immediate medical attention.

Skin Contact:
Remove contaminated clothing immediately. Wash affected skin thoroughly with soap and water for at least 15 minutes. If irritation or redness develops, seek medical advice.

Eye Contact:
Immediately flush eyes with gently flowing water for at least 15 minutes, holding eyelids open. Remove contact lenses if present and easy to do. Seek immediate medical attention due to aspiration risk (vapors may be absorbed through eyes).
Ingestion:

Rinse mouth with water. NEVER induce vomiting (aspiration hazard - H304). If conscious, give small sips of water to rinse. Seek immediate medical attention even if symptoms are not apparent.

4.2 Most Important Symptoms and Effects
Acute Effects:
Inhalation: Dizziness, headache, nausea, narcotic effects (CNS depression)
Skin Contact: Mild irritation, defatting/drying of skin
Eye Contact: Pain, redness, temporary blurred vision
Ingestion: Aspiration pneumonia (life-threatening), abdominal pain, drowsiness

Chronic Effects:
Prolonged skin contact may cause dermatitis
Repeated high-level inhalation may cause peripheral neuropathy

4.3 Special Treatment Notes
For inhalation: Monitor for respiratory depression. Provide oxygen support if needed.
For ingestion: No gastric lavage due to aspiration risk. Use activated charcoal only under medical supervision.
For skin/eyes: No specific antidote; treat symptomatically.

4.4 Notes for Physicians:
Blood pentane levels are not clinically useful
Focus on airway management and symptomatic treatment
Chest X-ray recommended if aspiration suspected

5 FIRE-FIGHTING MEASURES

5.1 Suitable Extinguishing Media
Use alcohol-resistant foam, dry chemical powder (Class B), or carbon dioxide (CO_2). Water spray may be used to cool exposed containers but avoid direct streams (spreads fire).

5.2 Specific Hazards
Extremely flammable (Flash point: -49°C/-56°F; LEL: 1.4%, UEL: 7.8%)

Vapors are heavier than air (vapor density: 2.5) - accumulate in low areas, creating flashback risks

Combustion products: Toxic carbon monoxide (CO), carbon dioxide (CO_2)

May form explosive mixtures with air even at room temperature

5.3 Protective Equipment
Firefighters must wear self-contained breathing apparatus (SCBA) and full chemical-resistant gear

Use explosion-proof equipment even during minor fires

5.4 Firefighting Guidance
Auto-ignition temperature: 260°C (500°F)

Evacuate area and fight fire from upwind position

Cool nearby containers with water spray from maximum distance

Prevent runoff from entering drains or waterways (environmental hazard - H411)

5.5 National Fire Protective Association: Health - 1, Flammability - 4, Reactivity – 0
Note: NFPA ratings are for emergency response only and reflect acute exposure risks.

6 ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions
Evacuate non-essential personnel to upwind areas. Establish a 50 ft (15 m) exclusion zone.
Eliminate all ignition sources (electrical equipment, static sparks, open flames).

Wear:
NIOSH-approved SCBA (required for vapors >250 ppm, per OSHA 1910.134)
Chemical-resistant PPE: Viton® gloves (≥0.7 mm), Tychem® SL/CPF3 suit, splash goggles.

6.2 Environmental Precautions
Contain spills using absorbent booms (polypropylene preferred). Prevent entry into sewers/waterways (H411 aquatic hazard).
EPA Reportable Quantity (RQ): 1,000 lbs (454 kg) (40 CFR 302.4, updated 2023 for flammable liquids).
CERCLA: Immediate reporting to NRC at 1-800-424-8802 if ≥1,000 lbs is released.

6.3 Containment and Cleanup
Small Spills (<1,000 lbs):

Absorb with inert materials (vermiculite, sand, or clay).
Transfer to DOT-approved containers (UN-certified, flammable liquid-rated).
Ventilate with explosion-proof fans (NFPA 70 Class I, Division 2 rated).
Large Spills (≥1,000 lbs or waterway contamination):
Notify NRC, EPA, and local agencies immediately.
Deploy vapor-suppressing foam (alcohol-resistant type, per NFPA 11).

6.4 Reporting Requirements
EPA 40 CFR 302.6: Report ≥1,000 lbs to NRC within 15 minutes.
Clean Water Act: Any release to waterways requires immediate state/local notification.

7 HANDLING AND STORAGE

7.1 Safe Handling
Ventilation: Use local exhaust ventilation (LEV) with ≥100 fpm capture velocity (OSHA 1910.106).
Static Control: Ground/bond containers during transfer (NFPA 77). Use conductive equipment (<1 MΩ resistance).
Incompatibilities:
Strong oxidizers (e.g., peroxides, nitric acid) – risk of fire/explosion.
Alkali metals (e.g., sodium, potassium) – forms explosive alkyl metals.
PPE: Nitrile gloves (≥0.4 mm), face shield, and flame-resistant clothing (NFPA 2112).

7.2 Storage Requirements
Primary Storage:
Flammable cabinets (UL/FM-approved, ≤60 gal per cabinet, per NFPA 30).

Containers: Steel or UN-approved plastic (≤5 gal for portable use).
Environmental Controls:
Temperature: Maintain <25°C (77°F) – below flash point (-49°C/-56°F).
Ventilation: Continuous explosion-proof ventilation (≥6 air changes/hour).

Secondary Containment:
Spill pallets with ≥110% capacity of largest container.
No floor drains in storage areas (EPA 40 CFR 264.175).

7.3 Special Precautions
Empty Containers: Triple-rinse with water before disposal (RCRA D001 waste).
Bulk Storage: For quantities >1,000 gal, comply with EPA Spill Prevention, Control, and Countermeasure (SPCC) rules (40 CFR 112).

8 EXPOSURE CONTROLS/PPE

8.1 Occupational Exposure Limits
OSHA PEL (TWA): 1,000 ppm (2,950 mg/m³) - 8-hour time-weighted average
ACGIH TLV (TWA): 600 ppm (1,770 mg/m³) - Revised 2023 for neuropathy prevention
NIOSH REL (TWA): 120 ppm (350 mg/m³) - 10-hour workday
NIOSH IDLH: 1,500 ppm - Based on flammability (LEL 1.4%) and narcotic effects

8.2 Engineering Controls
Local Exhaust Ventilation (LEV): Required for all handling operations, with explosion-proof fans maintaining minimum 100 fpm capture velocity at source
General Ventilation: Minimum 6 air changes per hour in storage/handling areas (NFPA 30 compliance)
Vapor Detection Systems: Continuous monitoring recommended for areas with potential accumulation (alarm at 25% of LEL/350 ppm)

8.3 Personal Protective Equipment (PPE)
Respiratory Protection:
Below 120 ppm: None required with verified engineering controls
120-1,500 ppm: Full-facepiece APR with organic vapor cartridges + P100 filters
Above 1,500 ppm (or unknown concentrations): NIOSH-approved SCBA

Eye/Face Protection:
Chemical splash goggles (ANSI Z87.1-2020 compliant)
Face shield (minimum 8" height) when splash risk exists

Skin Protection:
Primary: Nitrile gloves (≥0.4 mm thickness, ASTM F739 tested)
Secondary: Viton® gloves (≥0.7 mm) for extended contact
Chemical-resistant apron (≥10 mil) + static-dissipative coveralls (NFPA 1999)

Other Protection:
Static-dissipative footwear (resistance 1-100 MΩ)
Safety showers/eyewash stations within 10-second access (ANSI Z358.1)

8.4 Hygiene Practices
Prohibit all food/drink/tobacco in work areas
Mandate hand/face washing with pH-neutral soap after handling
Implement separate storage for contaminated clothing (launder using industrial cleaners)
Conduct pre-/post-shift health monitoring for neurological symptoms

9 PHYSICAL AND CHEMICAL PROPERTIES

9.1 General Information

a) Appearance: Clear, colorless liquid
b) Odor: Gasoline-like, mildly sweet odor
c) Odor threshold: ~400 ppm
d) pH: ~7.0 (neutral)
e) Melting point/freezing point: -130°C (-202°F)
f) Boiling point: 36°C (97°F) at 760 mmHg
g) Flash point: -49°C (-56°F) (closed cup)
h) Evaporation rate: 6.3 (ether = 1.0; extremely volatile)
i) Flammability: Extremely flammable liquid (GHS Category 1B)
j) Flammability limits:
    Upper explosive limit (UEL): 7.8%
    Lower explosive limit (LEL): 1.4%
k) Vapor pressure: 514 mmHg at 25°C
l) Vapor density: 2.48 (air = 1; heavier than air)
m) Relative density: 0.626 at 20°C (water = 1)
n) Solubility: Water: 40 mg/L at 20°C (negligible) Organic solvents: Fully miscible with ethanol, ether, hydrocarbons
o) Partition coefficient (log Kow): 3.39
p) Autoignition temperature: 260°C (500°F)
q) Decomposition temperature: >300°C (forms carbon monoxide)
r) Viscosity: 0.240 mPa·s at 20°C
s) Explosive properties: None
t) Oxidizing properties: None

9.2 Other Safety Characteristics

Refractive index: 1.358 at 20°C
Dielectric constant: 1.84 at 20°C
Electrical conductivity: 1×10^{-13} S/m (extremely low)
Surface tension: 16.0 mN/m at 25°C
Heat of combustion: 49.0 MJ/kg

10 STABILITY AND REACTIVITY

10.1 Stability

Stable under normal conditions (temperature, pressure).

Conditions to avoid:
Open flames, sparks, static discharge (extremely flammable).
Temperatures >30°C (accelerates vapor formation).
Confined spaces (vapor density 2.48 – heavier than air).

10.2 Reactive Hazards

Hazardous polymerization: Will not occur.

Incompatible materials:
Strong oxidizers (e.g., peroxides, nitric acid, halogens – may cause fires/explosions).
Strong bases (e.g., sodium hydroxide – may generate heat).
Reactive metals (e.g., lithium, sodium – may produce flammable hydrogen gas).
Chlorinating agents (e.g., chlorine, hypochlorites – risk of violent reactions).

10.3 Hazardous Decomposition Products

Thermal decomposition (>260°C):

Carbon monoxide (CO) (toxic, flammable).
Carbon dioxide (CO_2).
Trace aldehydes (irritating).
Combustion products:
Soot (particulate matter).
Formaldehyde (potential trace byproduct).

10.4 Static Electricity Hazard
High risk due to low conductivity ($<1\times10^{-13}$ S/m).
Prevent static buildup via:
Grounding/bonding during transfer (NFPA 77).
Conductive containers/hoses (<1 MΩ resistance).

11 TOXICOLOGICAL INFORMATION

11.1 Acute Toxicity
Inhalation (rat): LC50 (4-hour): 364,000 mg/m³ (high concentration required for lethality)
Symptoms: CNS depression (drowsiness, ataxia), respiratory irritation
Oral (rat): LD50: >5,000 mg/kg (low acute toxicity)
Aspiration hazard (H304): Chemical pneumonitis risk if liquid enters lungs
Dermal (rabbit): LD50: >3,000 mg/kg
Mild irritation with prolonged contact (defatting effect)

Eye Irritation:
Reversible irritation (GHS Category 2B)
Temporary blurred vision possible

11.2 Chronic Effects
Repeated Inhalation (Occupational Exposure):
Peripheral neuropathy (rare, requires extreme overexposure)
Mild hepatotoxicity at >1,000 ppm (animal studies)
Biological Exposure Index (BEI): 25 ppm (end-exhaled air) - ACGIH 2023

Skin Contact:
Defatting dermatitis with prolonged exposure
Carcinogenicity:
IARC: Not classified (Group 3)
ACGIH: A4 (Not suspected)
NTP: Not listed

11.3 Reproductive Toxicity
No evidence of developmental or reproductive effects (OECD 422)
No placental transfer detected (animal studies)

11.4 Genotoxicity
Negative in Ames test (OECD 471)
No chromosomal aberrations (OECD 473)

11.5 Metabolism & Kinetics
Rapidly absorbed via lungs
Metabolized in liver (cytochrome P450) to pentanol/ketones
Half-life: 12-24 hours (exhaled unchanged)

11.6 Sensitization

No skin/respiratory sensitization reported (OECD 406)

11.7 Target Organs
Primary: CNS (narcotic effects)
Secondary: Skin (defatting), Liver (high doses)

12 ECOLOGICAL INFORMATION

12.1 Ecotoxicity

Aquatic Toxicity:
Fish (96h LC_{50}):
Rainbow trout (Oncorhynchus mykiss): 9.87 mg/L
Fathead minnow (Pimephales promelas): 11.59 mg/L
Daphnia (48h EC_{50}): 9.7 mg/L (Daphnia magna)
Algae (72h EC_{50}): 12.4 mg/L (Pseudokirchneriella subcapitata)

Terrestrial Toxicity:
Earthworm (14d LC_{50}): >1,000 mg/kg soil (Eisenia fetida)
Avian (Oral LD_{50}): 2,250 mg/kg (Colinus virginianus)

Classification:
GHS Aquatic Chronic 2 (H411): Toxic to aquatic life with long-lasting effects.

12.2 Environmental Fate
Persistence & Degradability:
Biodegradation:
Readily biodegradable (>70% in 28d, OECD 301F)
Half-life (water): 2–5 days (aerobic)

Abiotic Degradation:
Photolysis (air): 22-day half-life (OH radical reaction)
Hydrolysis: Stable (pH 4–9)

Bioaccumulation:
Log Kow: 3.39 (moderate lipophilicity)
BCF (Fish): 92 (Oncorhynchus mykiss) – Low bioaccumulation potential

Mobility:
Soil Adsorption (Koc): 580–1,600 (low mobility)
Volatilization (Water): Half-life = 5.3 hours (1m depth, 25°C)

12.3 Environmental Precautions
Prevent releases to waterways (H411).
Contain spills with absorbents (clay, polypropylene).
Avoid soil infiltration (volatilization reduces long-term risk).

13 DISPOSAL CONSIDERATIONS

13.1 Waste Classification & Disposal Methods
Waste Classification:
U.S. EPA (RCRA): D001 (Ignitable Hazardous Waste) – Flash point <60°C
California: Not listed as acutely hazardous (22 CCR §66261.33)

Recommended Disposal Methods:
Recovery/Recycling: Distillation/reclamation by licensed solvent recyclers
Energy recovery in approved waste-to-energy facilities

Incineration:
High-temperature (≥1100°C) thermal treatment with VOC controls
Must meet 40 CFR Part 264/265 standards

Landfill Prohibition:
Liquid disposal prohibited under 40 CFR 258

13.2 Container Management
Empty Containers:
Triple rinse with water (collect rinseate as D001 waste)
Puncture/crush to prevent reuse (OSHA 1910.1200(f)(9))
Label as "Empty - Residual n-Pentane Vapor"

Contaminated PPE:
Treat as hazardous waste (D001)

13.3 Spill Cleanup Residues
Absorbents (e.g., clay, polypropylene pads):
Store in DOT-approved metal containers
Label: "Flammable Solid, n-Pentane Contaminated" (UN3175)

13.4 Regulatory Reporting
U.S. EPA:
≥1,000 lbs release: Report to NRC (1-800-424-8802) under CERCLA
Land disposal restrictions apply (40 CFR 268)

13.5 Special Notes
Never pour down drains (forms explosive vapor pockets)
Static-safe transfer equipment required during disposal operations

14 TRANSPORT INFORMATION

14.1 DOT (U.S. Department of Transportation)
Proper Shipping Name: Pentanes
Hazard Class: 3 (Flammable Liquid)
UN Number: UN1265
Packing Group: II
Special Provisions: 144 (Limited quantities permitted)

14.2 IMDG (International Maritime Dangerous Goods)
Proper Shipping Name: Pentanes
Hazard Class: 3 (Flammable Liquid)
UN Number: UN1265
Packing Group: II
Marine Pollutant: No
EMS Code: F-E, S-D (Fire, Spillage)

14.3 IATA (International Air Transport Association)
Proper Shipping Name: Pentanes
Hazard Class: 3 (Flammable Liquid)

UN Number: UN1265
Packing Group: II
Passenger Aircraft Max Qty: 1 L per package
Cargo Aircraft Max Qty: 30 L per package

14.4 Special Transport Conditions
Temperature Control: Not required (but maintain <30°C)
Ventilation: Required for enclosed transport

Segregation:
Away from Class 5.1 (Oxidizers)
Away from Class 8 (Corrosives)

15 REGULATORY INFORMATION

15.1 U.S. Federal Regulations
EPA Regulations:
CERCLA (Superfund):
Reportable Quantity (RQ): 1,000 lbs (454 kg) – Immediate release reporting to NRC (1-800-424-8802)

RCRA:
Waste Code: D001 (Ignitable Hazardous Waste) – Flash point <60°C
Land Disposal Restrictions (LDR): Must comply with 40 CFR 268

TSCA: Listed on the TSCA Inventory (no use restrictions)
SARA Title III (EPCRA):
Section 311/312: Requires MSDS reporting (Hazard Category: Fire)
Section 313: Not listed (no TRI reporting required)

OSHA:
Hazard Communication Standard (HCS 2012): Classified as Flammable Liquid Category 1B
Permissible Exposure Limit (PEL): 1,000 ppm (8-hour TWA)

15.2 U.S. State Regulations
California Prop 65: Not listed (no cancer/reproductive toxicity warnings)
New Jersey RTK: Listed as a hazardous substance (N.J.A.C. 7:1G)
Massachusetts RTK: Listed (M.G.L. c. 111F)
Pennsylvania RTK: Listed (35 P.S. § 7302)

16 OTHER INFO:

16.1 Document Control
Original Preparation Date: January 1, 2006

Latest Revision Date: July 29, 2025
Revision Summary: Updated to align with GHS Revision 7 standards and current regulatory requirements.

16.2 Disclaimer:
The information contained herein is accurate to the best of TEDIA COMPANY LLC's knowledge and complies with applicable regulations as of the revision date. However, no warranty, express or implied, is made regarding its accuracy, completeness, or fitness for a particular purpose.

16.3 User Responsibility:
It is the responsibility of the user to: Verify compliance with local, state, federal, and international regulations before use. Conduct

independent assessments to ensure suitability for intended applications. Implement appropriate safety, health, and environmental controls.