

Genetron® 410A**00000009881**

Version 2.7

Revision Date 04/18/2014

Print Date 04/14/2015

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Genetron® 410A

MSDS Number : 00000009881

Product Use Description : Refrigerant

Manufacturer or supplier's details : Honeywell International Inc.
101 Columbia Road
Morristown, NJ 07962-1057

For more information call : 800-522-8001
+1-973-455-6300
(Monday-Friday, 9:00am-5:00pm)

In case of emergency call : **Medical: 1-800-498-5701 or +1-303-389-1414**
: **Transportation (CHEMTREC): 1-800-424-9300 or +1-703-527-3887**
:
: (24 hours/day, 7 days/week)

SECTION 2. HAZARDS IDENTIFICATION**Emergency Overview**

Form : Liquefied gas

Color : colourless

Odor : weak

Classification of the substance or mixture

Classification of the substance or mixture : Gases under pressure, Liquefied gas
Simple Asphyxiant

GHS Label elements, including precautionary statements

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Symbol(s)

:



Signal word

: Warning

Hazard statements

: Contains gas under pressure; may explode if heated.
May displace oxygen and cause rapid suffocation.

Precautionary statements

: **Prevention:**
Use personal protective equipment as required.**Storage:**

Protect from sunlight. Store in a well-ventilated place.

Hazards not otherwise
classified: May cause eye and skin irritation.
May cause frostbite.
May cause cardiac arrhythmia.**Carcinogenicity**

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP, IARC, or OSHA.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature

: Mixture

| Chemical Name | CAS-No. | Concentration |
|-------------------|----------|---------------|
| Pentafluoroethane | 354-33-6 | 50.00 % |
| Difluoromethane | 75-10-5 | 50.00 % |

SECTION 4. FIRST AID MEASURES

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- Inhalation : Move to fresh air. If breathing is irregular or stopped, administer artificial respiration. Use oxygen as required, provided a qualified operator is present. Call a physician. Do not give drugs from adrenaline-ephedrine group.
- Skin contact : After contact with skin, wash immediately with plenty of water. If there is evidence of frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering. If symptoms persist, call a physician.
- Eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. In case of frostbite water should be lukewarm, not hot. If symptoms persist, call a physician.
- Ingestion : Unlikely route of exposure. As this product is a gas, refer to the inhalation section. Do not induce vomiting without medical advice. Call a physician immediately.

Notes to physician

- Treatment : Because of the possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution and only in situations of emergency life support. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions. Treat frost-bitten areas as needed.

SECTION 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : The product is not flammable.
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Specific hazards during firefighting : Contents under pressure.
This product is not flammable at ambient temperatures and atmospheric pressure.
However, this material can ignite when mixed with air under pressure and exposed to strong ignition sources.
Container may rupture on heating.
Cool closed containers exposed to fire with water spray.

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Do not allow run-off from fire fighting to enter drains or water courses.

Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.

In case of fire hazardous decomposition products may be produced such as:

Hydrogen halides

Hydrogen fluoride

Carbon monoxide

Carbon dioxide (CO₂)

Carbonyl halides

Special protective equipment for firefighters : In the event of fire and/or explosion do not breathe fumes. Wear self-contained breathing apparatus and protective suit. No unprotected exposed skin areas.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions : Immediately evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Wear personal protective equipment. Unprotected persons must be kept away. Remove all sources of ignition. Avoid skin contact with leaking liquid (danger of frostbite). Ventilate the area. After release, disperses into the air. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. Avoid accumulation of vapours in low areas. Unprotected personnel should not return until air has been tested and determined safe. Ensure that the oxygen content is $\geq 19.5\%$.

Environmental precautions : Prevent further leakage or spillage if safe to do so. The product evaporates readily.

Methods for cleaning up : Ventilate the area.

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SECTION 7. HANDLING AND STORAGE**Handling**

Handling : Handle with care.
Avoid inhalation of vapour or mist.
Do not get in eyes, on skin, or on clothing.
Wear personal protective equipment.
Use only in well-ventilated areas.
Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50 °C.
Follow all standard safety precautions for handling and use of compressed gas cylinders.
Use authorized cylinders only.
Protect cylinders from physical damage.
Do not puncture or drop cylinders, expose them to open flame or excessive heat.
Do not pierce or burn, even after use. Do not spray on a naked flame or any incandescent material.
Do not remove screw cap until immediately ready for use.
Always replace cap after use.

Advice on protection against fire and explosion : The product is not flammable.
Can form a combustible mixture with air at pressures above atmospheric pressure.

Storage

Requirements for storage areas and containers : Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50 °C. Do not pierce or burn, even after use.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Storage rooms must be properly ventilated.
Ensure adequate ventilation, especially in confined areas.
Protect cylinders from physical damage.
Store away from incompatible substances.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective measures : Do not breathe vapour.

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- Avoid contact with skin, eyes and clothing.
Ensure that eyewash stations and safety showers are close to the workstation location.
- Engineering measures : General room ventilation is adequate for storage and handling. Perform filling operations only at stations with exhaust ventilation facilities.
- Eye protection : Wear as appropriate:
Safety glasses with side-shields
If splashes are likely to occur, wear:
Goggles or face shield, giving complete protection to eyes
- Hand protection : Leather gloves
In case of contact through splashing:
Protective gloves
Neoprene gloves
Polyvinyl alcohol or nitrile- butyl-rubber gloves
- Skin and body protection : Avoid skin contact with leaking liquid (danger of frostbite).
Wear cold insulating gloves/ face shield/ eye protection.
- Respiratory protection : In case of insufficient ventilation, wear suitable respiratory equipment.
Wear a positive-pressure supplied-air respirator.
Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.
For rescue and maintenance work in storage tanks use self-contained breathing apparatus.
- Hygiene measures : Handle in accordance with good industrial hygiene and safety practice.
Ensure adequate ventilation, especially in confined areas.
Avoid contact with skin, eyes and clothing.
Remove and wash contaminated clothing before re-use.
Keep working clothes separately.
- Hygiene measures : Handle in accordance with good industrial hygiene and safety practice.
Ensure adequate ventilation, especially in confined areas.
When using do not eat, drink or smoke.
Remove and wash contaminated clothing before re-use.
Keep working clothes separately.
Do not breathe vapour.
Avoid contact with skin, eyes and clothing.

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Exposure Guidelines

| Components | CAS-No. | Value | Control parameters | Update | Basis |
|-------------------|----------|--------------------------------------|--|--------|--|
| Difluoromethane | 75-10-5 | TWA : time weighted average | 2,200 mg/m ³ (1,000 ppm) | 2007 | WEEL:US. AIHA Workplace Environmental Exposure Level (WEEL) Guides |
| Difluoromethane | 75-10-5 | TWA : time weighted average | (1,000 ppm) | 1994 | Honeywell:Limit established by Honeywell International Inc. |
| Pentafluoroethane | 354-33-6 | TWA : time weighted average | 4,900 mg/m ³ (1,000 ppm) | 2007 | WEEL:US. AIHA Workplace Environmental Exposure Level (WEEL) Guides |
| Pentafluoroethane | 354-33-6 | TWA : time weighted average | (1,000 ppm) | | Honeywell:Limit established by Honeywell International Inc. |

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|------------------------------|------------------------|
| Physical state | : Liquefied gas |
| Color | : colourless |
| Odor | : weak |
| pH | : Note: neutral |
| Melting point/freezing point | : Note: not determined |

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| | |
|--|--|
| Boiling point/boiling range | : -48.5 °C |
| Flash point | : Note: not applicable |
| Evaporation rate | : > 1 Method: Compared to CCl4. |
| lower flammability limit | : Note: None |
| upper flammability limit | : Note: None |
| Vapor pressure | : 14,844 hPa at 21.1 °C(70.0 °F) 33,798 hPa at 54.4 °C(129.9 °F) |
| Vapor density | : 3 Note: (Air = 1.0) |
| Density | : 1.08 g/cm ³ at 21.1 °C |
| Water solubility | : Note: no data available |
| Partition coefficient: n-octanol/water | : log Pow: 1.48 Test substance: Ethane, pentafluoro- (HFC-125) log Pow: 0.21 Test substance: Difluoromethane (HFC-32) |
| Ignition temperature | : > 750 °C |
| Decomposition temperature | : > 250 °C |

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Global warming potential (GWP) : 1,975
Ozone depletion potential (ODP) : 0

SECTION 10. STABILITY AND REACTIVITY

Chemical stability : Stable under normal conditions.

Possibility of hazardous reactions : Hazardous polymerisation does not occur.

Conditions to avoid : Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50 °C.
Decomposes under high temperature.
Some risk may be expected of corrosive and toxic decomposition products.
Can form a combustible mixture with air at pressures above atmospheric pressure.
Do not mix with oxygen or air above atmospheric pressure.

Incompatible materials to avoid : Finely divided aluminium
Potassium
Calcium
Powdered metals
Aluminium
Magnesium
Zinc

Hazardous decomposition products : In case of fire hazardous decomposition products may be produced such as:
Hydrogen fluoride
Carbonyl halides
Carbon monoxide
Carbon dioxide (CO₂)

SECTION 11. TOXICOLOGICAL INFORMATION

Acute inhalation toxicity
Pentafluoroethane : > 769000 ppm
Exposure time: 4 h

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| | |
|---|---|
| | Species: rat |
| Difluoromethane | : LC50: > 520000 ppm Exposure time: 4 h Species: rat |
| Sensitisation Pentafluoroethane | : Cardiac sensitization Species: dogs Note: No-observed-effect level 75 000 ppm Lowest observable effect level 100 000 ppm |
| Difluoromethane | : Cardiac sensitization Species: dogs Note: No-observed-effect level >350 000 ppm |
| Repeated dose toxicity Pentafluoroethane | : Species: rat Application Route: Inhalation Exposure time: (4 Weeks) NOEL: 50000 ppm Subchronic toxicity |
| Difluoromethane | : Species: rat Application Route: Inhalation Exposure time: (90 d) NOEL: 50000 ppm Subchronic toxicity |
| Genotoxicity in vitro Pentafluoroethane | : Test Method: Ames test Result: negative |
| Difluoromethane | : Test Method: Ames test Result: negative |
| | : Cell type: Human lymphocytes Result: negative |

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- : Cell type: Chinese Hamster Ovary Cells
Result: negative
- : Cell type: Human lymphocytes
Result: negative
Method: Mutagenicity (in vitro mammalian cytogenetic test)
- : Test Method: Chromosome aberration test in vitro
Result: negative
- Genotoxicity in vivo
Difluoromethane : Species: mouse
Cell type: Bone marrow
Method: Mutagenicity (micronucleus test)
Result: negative
- Teratogenicity
Pentafluoroethane : Species: rabbit
Application Route: Inhalation exposure
NOAEL, Teratog: 50,000 ppm
NOAEL, Maternal: 50,000 ppm
Note: Did not show teratogenic effects in animal experiments.
- Species: rat
Application Route: Inhalation exposure
NOAEL, Teratog: 50,000 ppm
NOAEL, Maternal: 50,000 ppm
Note: Did not show teratogenic effects in animal experiments.
- Difluoromethane : Species: rat
Dose: NOEL - 50,000 ppm
Note: Did not show teratogenic effects in animal experiments.
- Species: rabbit
Dose: NOEL - 50,000 ppm
Note: Did not show teratogenic effects in animal experiments.
- Further information : Acute toxicity Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. Rapid evaporation of the liquid may cause frostbite. May cause

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cardiac arrhythmia.

SECTION 12. ECOLOGICAL INFORMATION

Biodegradability
Pentafluoroethane : Result: Not readily biodegradable.
Value: 5 %
Method: OECD 301 D

Difluoromethane : Note: Minimal

Further information on ecology

Additional ecological information : This product is subject to U.S. Environmental Protection Agency Clean Air Act Regulations at 40 CFR Part 82. This product contains greenhouse gases which may contribute to global warming. Do NOT vent to the atmosphere. To comply with provisions of the U.S. Clean Air Act, any residual must be recovered.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods : Observe all Federal, State, and Local Environmental regulations.

Note : This product is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82 regarding refrigerant recycling.

SECTION 14. TRANSPORT INFORMATION

DOT UN/ID No. : UN 3163
Proper shipping name : LIQUEFIED GAS, N.O.S.
(Pentafluoroethane, Difluoromethane)

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| | |
|---------------|-----|
| Class | 2.2 |
| Packing group | |
| Hazard Labels | 2.2 |

| | | |
|-------------|--|---|
| IATA | UN/ID No. | : UN 3163 |
| | Description of the goods | : LIQUEFIED GAS, N.O.S. (Pentafluoroethane, Difluoromethane) |
| | Class | : 2.2 |
| | Hazard Labels | : 2.2 |
| | Packing instruction (cargo aircraft) | : 200 |
| | Packing instruction (passenger aircraft) | : 200 |

| | | |
|-------------|--------------------------|--|
| IMDG | UN/ID No. | : UN 3163 |
| | Description of the goods | : LIQUEFIED GAS, N.O.S. (PENTAFLUOROETHANE, DIFLUOROMETHANE) |
| | Class | : 2.2 |
| | Hazard Labels | : 2.2 |
| | EmS Number | : F-C, S-V |
| | Marine pollutant | : no |

SECTION 15. REGULATORY INFORMATION**Inventories**

US. Toxic Substances Control Act : On TSCA Inventory

Australia. Industrial Chemical (Notification and Assessment) Act : On the inventory, or in compliance with the inventory

Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL) : All components of this product are on the Canadian DSL.

Japan. Kashin-Hou Law List : On the inventory, or in compliance with the inventory

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Korea. Toxic Chemical Control Law (TCCL) List : On the inventory, or in compliance with the inventory

Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act : On the inventory, or in compliance with the inventory

China. Inventory of Existing Chemical Substances : On the inventory, or in compliance with the inventory

NZIOC - New Zealand : On the inventory, or in compliance with the inventory

National regulatory information

SARA 302 Components : SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components : SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

SARA 311/312 Hazards : Acute Health Hazard
Sudden Release of Pressure Hazard

California Prop. 65 : WARNING! This product contains a chemical known to the State of California to cause cancer.
Dichloromethane 75-09-2

Massachusetts RTK : Dichloromethane 75-09-2

New Jersey RTK : Difluoromethane 75-10-5

Pennsylvania RTK : Difluoromethane 75-10-5

WHMIS Classification : A: Compressed Gas

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This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.

Global warming potential : 1,975

Ozone depletion potential (ODP) : 0

SECTION 16. OTHER INFORMATION

| | HMIS III | NFPA |
|-----------------|-----------------|-------------|
| Health hazard | : 1 | 2 |
| Flammability | : 1 | 1 |
| Physical Hazard | : 0 | |
| Instability | : | 0 |

Hazard rating and rating systems (e.g. HMIS® III, NFPA): This information is intended solely for the use of individuals trained in the particular system.

Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. Final determination of suitability of any material is the sole responsibility of the user. This information should not constitute a guarantee for any specific product properties.

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

Previous Issue Date: 09/11/2013

Prepared by Honeywell Performance Materials and Technologies Product Stewardship Group

Article Information Sheet (AIS)

This Article Information Sheet (AIS) provides relevant battery information to retailers, consumers, OEMs and others users requesting a GHS-compliant SDS. Articles, such as batteries, are exempt from GHS SDS classification criteria. The GHS criteria is not designed or intended to be used to classify the physical, health and environmental hazards of an article. Branded consumer batteries are defined as electro-technical devices. The design, safety, manufacture, and qualification of branded consumer batteries follow ANSI and IEC battery standards. This document is based on principles set forth in the following hazard communication approaches: ANSI Z-400.1, GHS, JAMP AIS, and IEC 62474.

| 1. Document Information | |
|--|--|
| Document Name | Duracell Alkaline Batteries (Major and Specialty Cells) |
| Document ID | AIS-ALK |
| Issue Date | 1-May-15 |
| Version | 1 |
| Preparer | Global Product Stewardship |
| Last Revision | New |
| Information Contact | moquet.l@pg.com |
| 2. Company Information | |
| Name & Address | P&G Duracell Global Business Unit, 14 Research Drive, Bethel, CT USA 06801 |
| Telephone | (203) 796- 4430 |
| Website | www.duracell.com |
| Consumer Relations | North America: 1-800-551-2355 (9:00 AM - 5:00 PM EST) |
| 3. Article Information | |
| Description | Duracell branded consumer alkaline battery |
| Product Category | Electro-technical device |
| Use | Portable power source for electronic devices |
| Global sub-brands (Retail) | Coppertop, Plus, Quantum, Simply, Turbo, Ultra, Basic, TurboMax |
| Global sub-brands (B2B) | Procell, Industrial, OEM/OEA |
| Sizes | <u>Major Cells</u> : AA,AAA, C, D & 9V |
| Sizes | <u>Specialty Cells</u> : AAAA, MN11, MN21, MN27, MN175, PX76 (LR44), PX28, PX625, (LR09), LR43, LR54, N, J, 4.5V, 625A |
| Sizes | <u>Lanterns</u> : MN903, MN908, MN915, MN918; MN1203 |
| Principles of Operation | A battery powers a device by converting stored chemical energy into electrical energy. |
| Representative Product Images |  |
| | <div style="display: flex; justify-content: space-around; text-align: center;"> <div>Major Cells</div> <div>Major Cells</div> <div>Lantern</div> <div>Specialty</div> </div> |
| 4. Article Construction | |
| Applicable Battery Industry Standards | ANSI C18.1M Part 1, ANSI C18.1M Part 2, ANSI C18.4, IEC 60086,1, IEC 60086-2, IEC 60086-5 |
| Electro-technical System | Alkaline Manganese Dioxide |
| Electrode - Negative | Zinc (CAS # 7440-66-6) |
| Electrode - Positive | Manganese Dioxide (CAS # 1313-13-9) |
| Electrolyte | Alkali Metal Hydroxide (aqueous potassium hydroxide - CAS # 1310-58-3) |
| Materials of Construction - Can | Nickel Plated Steel |
| Declarable Substances (IEC 62474 Criteria 1) | None |
| Mercury Free Battery (ANSI C18.4M <500m) | Yes |
| Small Cell or Battery (ANSI C18.1M Part 2; IEC 60086-5) | Sizes: AAA and Specialty Cells fit inside a specially designed test cylinder 2.25 inches (57.1mm) long by 1.25 inches (31.70 mm) wide. |
| 5. Health & Safety | |

Article Information Sheet (AIS)

| | |
|---|--|
| Ingestion/Small Parts Warning | <u>Required for Small Cell or Battery (Sizes: AAA and Specialty Cells):</u> Keep away from children. If swallowed, consult a physician immediately. |
| Normal Conditions of Use | Exposure to contents inside the sealed battery will not occur unless the battery leaks, is exposed to high temperatures, or is mechanically abused. |
| Note to Physician | A damaged battery will release concentrated and caustic potassium hydroxide. |
| First Aid - If swallowed | Do not induce vomiting. Seek medical attention immediately. USA CALLS ONLY - CALL 24-HOUR NATIONAL BATTERY INGESTION HOTLINE: (202) 625-3333 - COLLECT. |
| First Aid - Eye Contact | Flush with water for at least 15 minutes. Seek medical care if irritation persists. |
| First Aid - Skin Contact | Remove contaminated clothing. Wash skin with soap and water. Seek medical care if irritation persists. |
| First Aid - Inhalation | Remove to fresh air. |
| Battery Safety Standards & Testing | Duracell batteries meet the requirements of ANSI C18. 1M Part 2 and IEC 60086-5. These standards specify tests and requirements for alkaline batteries to ensure safe operation under normal use and reasonably foreseeable misuse. The test regimes assess three conditions of safety. These are: <u>1-Intended use simulation:</u> Partial use, vibration, thermal shock, and mechanical shock <u>2-Reasonably foreseeable misuse:</u> Incorrect installation, external short-circuit, free fall (user-drop), over-discharge, and crush <u>3-Design consideration:</u> Thermal abuse, mold stress |
| Precautionary Statements | CAUTION: Batteries may explode or leak, and cause burn injury, if recharged, disposed of in fire, mixed with a different battery type, inserted backwards or disassembled. Replace all used batteries at the same time. Do not carry batteries loose in your pocket or purse. Do not remove the battery label. Keep small batteries (i.e., AAA) away from children. If swallowed, consult a physician at once. |
| 6. Fire Hazard & Firefighting | |
| Fire Hazard | Batteries may rupture or leak if involved in a fire. |
| Extinguishing Media | Use any extinguishing media appropriate for the surrounding area. |
| Fires Involving Large Quantities of Batteries | Large quantities of batteries involved in a fire will rupture and release caustic potassium hydroxide. Firefighters should wear self-contained breathing apparatus and protective clothing. |
| 7. Handling & Storage | |
| Handling Precautions | Avoid mechanical and electrical abuse. Do not short circuit or install incorrectly. Batteries may rupture or vent if disassembled, crushed, recharged or exposed to high temperatures. Install batteries in accordance with equipment instructions. |
| Storage Precautions | Store batteries in a dry place at normal room temperature. Refrigeration does not make them last longer. |
| Spills of Large Quantities of Loose Batteries (unpackaged) | Notify spill personnel of large spills. Irritating and flammable vapors may be released from leaking or ruptured batteries. Spread batteries apart to stop shorting. Eliminate all ignition sources. Evacuate area and allow vapors to dissipate. Clean-up personnel should wear appropriate PPE to avoid eye and skin contact and inhalation of vapors or fumes. Increase ventilation. Carefully collect batteries and place in appropriate container for disposal. Remove any spilled liquid with absorbent material and contain for disposal. |
| 8. Disposal Considerations (GHS Section 13) | |
| Collection & Proper Disposal | Dispose of used (or excess) batteries in compliance with federal, state/provincial and local regulations. Do not accumulate large quantities of used batteries for disposal as accumulations could cause batteries to short-circuit. Do not incinerate. In countries, such as Canada and the EU, where there are regulations for the collection and recycling of batteries, consumers should dispose of their used batteries into the collection network at municipal depots and retailers. They should not dispose of batteries with household trash. |

Article Information Sheet (AIS)

| | |
|---|---|
| USA EPA RCRA (40 CFR 261) | Classified as non-hazardous waste (not ignitable, corrosive, reactive or toxic). Federal Universal Waste Regulations (40 CFR 273) do not apply. State requirements may be more stringent than Federal. |
| California Universal Waste Rule (Cal. Code Regs. Title 22, Div. 4.5, Ch. 23) | California prohibits disposal of batteries as trash (including household trash). |
| 9. Transport Information (GHS Section 14) | |
| Regulatory Status | Not regulated. Alkaline batteries (sometimes referred to as "Dry Cell" or "household" batteries) are not listed or regulated as dangerous goods under IATA Dangerous Goods Regulations, ICAO Technical Instructions, IMDG Code, UN Model Regulations, U.S. Hazardous Materials Regulations (49 CFR), and UNECE ADR. |
| UN Identification Number/ Shipping Name | None - Not Required |
| Special Provision (SP) Conformance | Special regulatory provisions require batteries to be packaged in a manner that prevents the generation of a dangerous quantity of heat and short circuits. Shippers can prepare batteries by taping the terminals, individually packaging batteries, or otherwise segregating the batteries to prevent risk of creating a short circuit. Batteries shipped in original unopened Duracell packaging is compliant. |
| US DOT SP | 49 CFR 172.102 Special Provision 130 |
| Air Transport (IATA/ICAO) SP | Special Provision A123 (56th Edition - 2015). NOTE: The words "NOT RESTRICTED" and "SPECIAL PROVISION A123" must be included on the description of the substance on the Air Waybill, when air way-bill is issued. |
| Passenger Air Travel | No restrictions |
| Emergency Transportation Hotline | CHEMTREC 24-Hour Emergency Response Hotline Within the United States call +703-527-3887 Outside the United States, call +1 703-527-3887 (Collect) |
| 10. Regulatory Information (GHS Section 15) | |
| 10a. Battery Requirements | |
| USA EPA Mercury Containing & Rechargeable Battery Management Act of 1996 | During the manufacturing process, no mercury is added. |
| EU Battery Directive 2006/66/EC & amendment 2013/56/EU | Compliant with marking and substance restrictions for mercury (<0.0005%); cadmium (<0.0020%) and lead (<0.0040%). Global labels are marked with the special collection symbol and the EU qualifier in accordance with EU Battery Directive 2006/66/EC, Article 11. Paragraph 1 on batteries and accumulators and waste batteries and accumulators |
| 10b. General Requirements | |
| USA CPSIA 2008 (PL. 11900314) | Exempt |
| USA CPSC FHSA (16 CFR 1500) | Consumer batteries are not listed as a hazardous product. |
| USA EPA TSCA Section 13 (40 CFR 707.20) | For customs clearance purpose, batteries are defined as an "Article". |
| USA EPA RCRA (40 CFR 261) | Classified as non-hazardous waste (not ignitable, corrosive, reactive or toxic). Federal Universal Waste Regulations (40 CFR 273) do not apply. State requirements may be more stringent than Federal. |
| California Prop 65 | No warning required per 3rd party assessment. |
| CANADA Products Containing Mercury Regulations SOR/20140254 | Mercury free |
| EU REACH SVHC's (161 Substances) Candidate List December 2014) | No listed substances are present (>0.01% w/w) |
| EU REACH Article 31 | SDS is not required consumer alkaline batteries. |

Article Information Sheet (AIS)

10c. Regulatory Definitions - Articles

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|----------|--|
| USA OSHA | 29 CFR 1910.1200(b)(6)(v) |
| USA TSCA | 40 CFR 704.3; 710.2(3)(c); and [19 CFR 12.1209a]] |
| EU REACH | Title 1 - Chapter 2 - Article 3(3) |
| GHS | Section 1.3.2.1 |

11. Other Information

11a. Certification & 3rd Party Approvals

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| UL (UTGT2.S50939 Single Multiple Station Smoke Alarms - Component) | AA, 9V Certification Standard: ANSI/UL 217 Single & Multiple Station Smoke Alarms |
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11b. AIS Hazard Communication Approaches (consulted in developing this document):

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|---|---|
| Globally Harmonized System (GHS) | GHS SDS requirements and classification criteria do not apply to articles or products (such as batteries) that have a fixed shape, which are not intended to release a chemical. The article exemption is found in Section 1.3.2.1.1 of the GHS and reads: <i>The GHS applies to pure substances and their dilute solutions and to mixtures. "Articles" as defined by the Hazard Communication Standard (29 CFR 1900.1200) of the OSHA of the USA, or by similar definition, are outside the scope of the system."</i> |
| Joint Article Management Promotion Consortium JAMP | JAMP is a Japanese Industry Association who developed the concept of an Article Information Sheet as a supply chain tool to share and communicate chemical information in articles. The AIS authoring process is based on “declarable” substances to meet global regulatory requirements as well as substances to be reported by GADSL, JIG, etc. |
| IEC 62474 Ed. 1.0 B:2012 Material Declaration for Products of and for the Electro-technical Industry | An international standard that came into effect in March 2012 concerning declaration for electrical and electronic products. IEC 6274 replaces the defunct Joint Industry Guide – Material Declaration for Electro-technical Products (JIG-101-Ed 4.1 (May 21, 2012) |
| IEC 62474 Database - Publically available online (maintained by TC11: Environmental Standardization for electrical and electronic products and systems. | The general principle for a substance to be included in the database as a declarable substance is: 1) existing national laws or regulations in an IEC member country that are relevant to Electro-technical products and that prohibit or restrict substances, or that have a labeling, communication, reporting or notification requirement, and 2) applying IEC 62474 criteria results in identification of declarable substance. |
| ANSI Z 400.1/Z19.1 (2010) | 2.1 Scope: Applies to preparation of SDSs for hazardous chemicals used under occupational conditions. Does not address how the standard may be applied to articles. It presents basic information on how to develop and write a SDS. Additional information is provided to help comply with state and federal environmental and safety laws and regulations. Elements of the standard may be acceptable for International use. |

DISCLAIMER: This AIS is intended to provide a brief summary of our knowledge and guidance regarding the use of this material. The information contained here has been compiled from sources considered by Procter & Gamble to be dependable and is accurate to the best of the Company’s knowledge. It is not meant to be an all-inclusive document on worldwide hazard communication regulations. This information is offered in good faith. Each user of this material needs to evaluate the conditions of use and design the appropriate protective mechanisms to prevent employee exposures, property damage or release to the environment. Procter & Gamble assumes no responsibility for injury to the recipient or third persons or for any damage to any property resulting from misuse of the product.

Article Information Sheet (AIS)

This Article Information Sheet (AIS) provides relevant battery information to retailers, consumers, OEMs and others users requesting a GHS-compliant SDS. Articles, such as batteries, are exempt from GHS SDS classification criteria. The GHS criteria is not designed or intended to be used to classify the physical, health and environmental hazards of an article. Branded consumer batteries are defined as electro-technical devices. The design, safety, manufacture, and qualification of branded consumer batteries follow ANSI and IEC battery standards. This document is based on principles set forth in the following hazard communication approaches: ANSI Z-400.1, GHS, JAMP AIS, and IEC 62474.

| 1. Document Information | |
|---|--|
| Document Name | Duracell Alkaline Batteries (Major and Specialty Cells) |
| Document ID | AIS-ALK |
| Issue Date | 1-May-15 |
| Version | 1 |
| Preparer | Global Product Stewardship |
| Last Revision | New |
| Information Contact | moquet.l@pg.com |
| 2. Company Information | |
| Name & Address | P&G Duracell Global Business Unit, 14 Research Drive, Bethel, CT USA 06801 |
| Telephone | (203) 796- 4430 |
| Website | www.duracell.com |
| Consumer Relations | North America: 1-800-551-2355 (9:00 AM - 5:00 PM EST) |
| 3. Article Information | |
| Description | Duracell branded consumer alkaline battery |
| Product Category | Electro-technical device |
| Use | Portable power source for electronic devices |
| Global sub-brands (Retail) | Coppertop, Plus, Quantum, Simply, Turbo, Ultra, Basic, TurboMax |
| Global sub-brands (B2B) | Procell, Industrial, OEM/OEA |
| Sizes | <u>Major Cells</u> : AA,AAA, C, D & 9V |
| Sizes | <u>Specialty Cells</u> : AAAA, MN11, MN21, MN27, MN175, PX76 (LR44), PX28, PX625, (LR09), LR43, LR54, N, J, 4.5V, 625A |
| Sizes | <u>Lanterns</u> : MN903, MN908, MN915, MN918; MN1203 |
| Principles of Operation | A battery powers a device by converting stored chemical energy into electrical energy. |
| Representative Product Images |  |
| | <div style="display: flex; justify-content: space-around; text-align: center;"> <div>Major Cells</div> <div>Major Cells</div> <div>Lantern</div> <div>Specialty</div> </div> |
| 4. Article Construction | |
| Applicable Battery Industry Standards | ANSI C18.1M Part 1, ANSI C18.1M Part 2, ANSI C18.4, IEC 60086,1, IEC 60086-2, IEC 60086-5 |
| Electro-technical System | Alkaline Manganese Dioxide |
| Electrode - Negative | Zinc (CAS # 7440-66-6) |
| Electrode - Positive | Manganese Dioxide (CAS # 1313-13-9) |
| Electrolyte | Alkali Metal Hydroxide (aqueous potassium hydroxide - CAS # 1310-58-3) |
| Materials of Construction - Can | Nickel Plated Steel |
| Declarable Substances (IEC 62474 Criteria 1) | None |
| Mercury Free Battery (ANSI C18.4M <500m) | Yes |
| Small Cell or Battery (ANSI C18.1M Part 2; IEC 60086-5) | Sizes: AAA and Specialty Cells fit inside a specially designed test cylinder 2.25 inches (57.1mm) long by 1.25 inches (31.70 mm) wide. |
| 5. Health & Safety | |

Article Information Sheet (AIS)

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| Ingestion/Small Parts Warning | <u>Required for Small Cell or Battery (Sizes: AAA and Specialty Cells):</u> Keep away from children. If swallowed, consult a physician immediately. |
| Normal Conditions of Use | Exposure to contents inside the sealed battery will not occur unless the battery leaks, is exposed to high temperatures, or is mechanically abused. |
| Note to Physician | A damaged battery will release concentrated and caustic potassium hydroxide. |
| First Aid - If swallowed | Do not induce vomiting. Seek medical attention immediately. USA CALLS ONLY - CALL 24-HOUR NATIONAL BATTERY INGESTION HOTLINE: (202) 625-3333 - COLLECT. |
| First Aid - Eye Contact | Flush with water for at least 15 minutes. Seek medical care if irritation persists. |
| First Aid - Skin Contact | Remove contaminated clothing. Wash skin with soap and water. Seek medical care if irritation persists. |
| First Aid - Inhalation | Remove to fresh air. |
| Battery Safety Standards & Testing | Duracell batteries meet the requirements of ANSI C18. 1M Part 2 and IEC 60086-5. These standards specify tests and requirements for alkaline batteries to ensure safe operation under normal use and reasonably foreseeable misuse. The test regimes assess three conditions of safety. These are: <u>1-Intended use simulation:</u> Partial use, vibration, thermal shock, and mechanical shock <u>2-Reasonably foreseeable misuse:</u> Incorrect installation, external short-circuit, free fall (user-drop), over-discharge, and crush <u>3-Design consideration:</u> Thermal abuse, mold stress |
| Precautionary Statements | CAUTION: Batteries may explode or leak, and cause burn injury, if recharged, disposed of in fire, mixed with a different battery type, inserted backwards or disassembled. Replace all used batteries at the same time. Do not carry batteries loose in your pocket or purse. Do not remove the battery label. Keep small batteries (i.e., AAA) away from children. If swallowed, consult a physician at once. |
| 6. Fire Hazard & Firefighting | |
| Fire Hazard | Batteries may rupture or leak if involved in a fire. |
| Extinguishing Media | Use any extinguishing media appropriate for the surrounding area. |
| Fires Involving Large Quantities of Batteries | Large quantities of batteries involved in a fire will rupture and release caustic potassium hydroxide. Firefighters should wear self-contained breathing apparatus and protective clothing. |
| 7. Handling & Storage | |
| Handling Precautions | Avoid mechanical and electrical abuse. Do not short circuit or install incorrectly. Batteries may rupture or vent if disassembled, crushed, recharged or exposed to high temperatures. Install batteries in accordance with equipment instructions. |
| Storage Precautions | Store batteries in a dry place at normal room temperature. Refrigeration does not make them last longer. |
| Spills of Large Quantities of Loose Batteries (unpackaged) | Notify spill personnel of large spills. Irritating and flammable vapors may be released from leaking or ruptured batteries. Spread batteries apart to stop shorting. Eliminate all ignition sources. Evacuate area and allow vapors to dissipate. Clean-up personnel should wear appropriate PPE to avoid eye and skin contact and inhalation of vapors or fumes. Increase ventilation. Carefully collect batteries and place in appropriate container for disposal. Remove any spilled liquid with absorbent material and contain for disposal. |
| 8. Disposal Considerations (GHS Section 13) | |
| Collection & Proper Disposal | Dispose of used (or excess) batteries in compliance with federal, state/provincial and local regulations. Do not accumulate large quantities of used batteries for disposal as accumulations could cause batteries to short-circuit. Do not incinerate. In countries, such as Canada and the EU, where there are regulations for the collection and recycling of batteries, consumers should dispose of their used batteries into the collection network at municipal depots and retailers. They should not dispose of batteries with household trash. |

Article Information Sheet (AIS)

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| USA EPA RCRA (40 CFR 261) | Classified as non-hazardous waste (not ignitable, corrosive, reactive or toxic). Federal Universal Waste Regulations (40 CFR 273) do not apply. State requirements may be more stringent than Federal. |
| California Universal Waste Rule (Cal. Code Regs. Title 22, Div. 4.5, Ch. 23) | California prohibits disposal of batteries as trash (including household trash). |
| 9. Transport Information (GHS Section 14) | |
| Regulatory Status | Not regulated. Alkaline batteries (sometimes referred to as "Dry Cell" or "household" batteries) are not listed or regulated as dangerous goods under IATA Dangerous Goods Regulations, ICAO Technical Instructions, IMDG Code, UN Model Regulations, U.S. Hazardous Materials Regulations (49 CFR), and UNECE ADR. |
| UN Identification Number/ Shipping Name | None - Not Required |
| Special Provision (SP) Conformance | Special regulatory provisions require batteries to be packaged in a manner that prevents the generation of a dangerous quantity of heat and short circuits. Shippers can prepare batteries by taping the terminals, individually packaging batteries, or otherwise segregating the batteries to prevent risk of creating a short circuit. Batteries shipped in original unopened Duracell packaging is compliant. |
| US DOT SP | 49 CFR 172.102 Special Provision 130 |
| Air Transport (IATA/ICAO) SP | Special Provision A123 (56th Edition - 2015). NOTE: The words "NOT RESTRICTED" and "SPECIAL PROVISION A123" must be included on the description of the substance on the Air Waybill, when air way-bill is issued. |
| Passenger Air Travel | No restrictions |
| Emergency Transportation Hotline | CHEMTREC 24-Hour Emergency Response Hotline Within the United States call +703-527-3887 Outside the United States, call +1 703-527-3887 (Collect) |
| 10. Regulatory Information (GHS Section 15) | |
| 10a. Battery Requirements | |
| USA EPA Mercury Containing & Rechargeable Battery Management Act of 1996 | During the manufacturing process, no mercury is added. |
| EU Battery Directive 2006/66/EC & amendment 2013/56/EU | Compliant with marking and substance restrictions for mercury (<0.0005%); cadmium (<0.0020%) and lead (<0.0040%). Global labels are marked with the special collection symbol and the EU qualifier in accordance with EU Battery Directive 2006/66/EC, Article 11. Paragraph 1 on batteries and accumulators and waste batteries and accumulators |
| 10b. General Requirements | |
| USA CPSIA 2008 (PL. 11900314) | Exempt |
| USA CPSC FHSA (16 CFR 1500) | Consumer batteries are not listed as a hazardous product. |
| USA EPA TSCA Section 13 (40 CFR 707.20) | For customs clearance purpose, batteries are defined as an "Article". |
| USA EPA RCRA (40 CFR 261) | Classified as non-hazardous waste (not ignitable, corrosive, reactive or toxic). Federal Universal Waste Regulations (40 CFR 273) do not apply. State requirements may be more stringent than Federal. |
| California Prop 65 | No warning required per 3rd party assessment. |
| CANADA Products Containing Mercury Regulations SOR/20140254 | Mercury free |
| EU REACH SVHC's (161 Substances) Candidate List December 2014) | No listed substances are present (>0.01% w/w) |
| EU REACH Article 31 | SDS is not required consumer alkaline batteries. |

Article Information Sheet (AIS)

10c. Regulatory Definitions - Articles

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