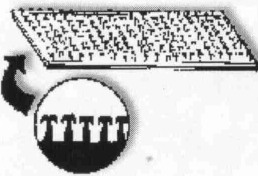
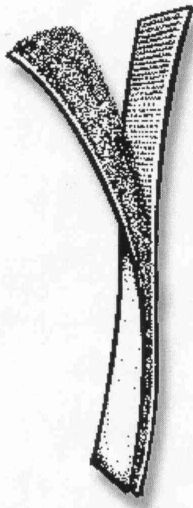
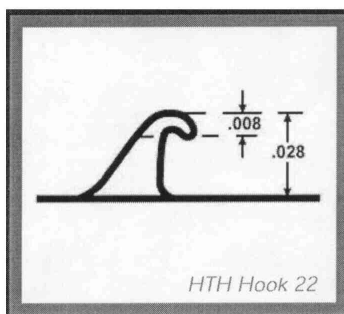
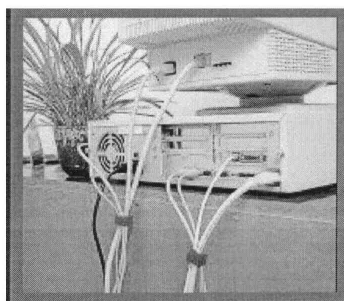


Hook & Loop Fastener Tapes



TYPE/BRAND	DESCRIPTION
VELCRO® brand woven nylon hook and loop	Industry-standard touch fasteners. 15 standard colors. Widths to 4".
VELCRO® brand knit loop	Wide variety of colors available. Widths to 60".
TEXACRO® brand woven nylon hook & loop	Value-packed, ready to ship traditional touch fasteners. 5 standard colors. Widths to 4".
VEL-STRETCH® brand Loop	An elastic loop with 55% stretch for high cycle life applications. Widths available: 5/8", 1", 1 1/2", 2". Available in black, white or beige.
MED-FLEX™ brand Loop	An elastic loop with 100% stretch for moderate cycle life applications. Widths available: 1", 1 1/2", 2". Available in white only.
VELCRO® brand Polyester Hook and Loop	For use where ultraviolet or chemical resistance may be required. Also recommended for applications in high humidity or moisture environments. Available widths: 1", 2".
MID-TEMP® brand Hook & Loop	A combination of NOMEX® yarn and non-corrosive metal. Designed for applications up to 450 degrees F.
HI-GARDE® brand Hook & Loop	All steel, heat and corrosion resistant, usage to 800 degrees F.
HI-AIR® brand Hook & Loop	Flame retardant. Specially woven from NOMEX® yarn. Meets and exceeds existing F.A.A. requirements.
HI-MEG® brand Hook & Loop	Electrically conductive, silver-coated fastening components offering excellent R.F.I. shielding characteristics.
VELCRO® brand Molded Hook #8 (MVA #8)	A molded nylon arrowhead hook designed for high strength applications. Available in 1" widths and in natural or black



Product Information Guide

ONE-WRAP®

FEATURING

ULTRA-MATE® BRAND HTH 22 HOOK

ONE-WRAP® (HTH 888) - A unique back-to-back fastening system featuring a polyethylene hook laminated to a nylon loop without the use of an adhesive.

ONE-WRAP® (HTH 889) - A flame retardant version of ONE-WRAP®. This product meets UL (Underwriter's Laboratory) requirements for a rating of 94-V2 and also meets requirements for FAR 25.853 A/B. *In addition, specified configurations of black ONE-WRAP® (HTH 889) meet the requirements for use in air handling applications in accordance with NEC's section 300-22 (C) & (D).*

ONE-WRAP®:

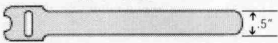


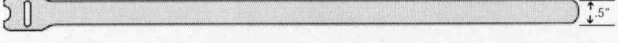
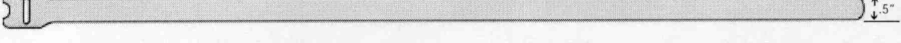

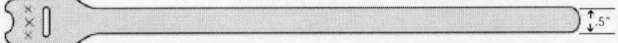
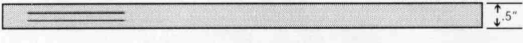
- Ideal for cord and cable control
- Can be slit, perforated and die-cut to meet specific requirements
- Can be cycled hundreds of times
- Operating temperature - 0 to 220 °F

Product Name	888	889
Average Shear (PSI)	23	29
Average Peel (PIW)	0.5	0.6
Colors:	Black, White, Beige, Gray, Royal Blue, Red, Coachman Green, Yellow, Orange, Brown & Purple	Black & Light Blue
Standard Widths:	3/8", 1/2", 5/8", 3/4", 1", 1-1/2", 2", 3", & 4"	3/8", 1/2", 5/8", 3/4", 1", 1-1/2", 2", 3", & 4"
Standard Put-Ups	25 yard reels	25 yard reels
Minimums:	Standard Widths - 100 yards Non-Standard Widths - Inquire	Contact Market Manager

See Reverse Side For Pre-Cut ONE-WRAP® Cable Control Straps

THE 2001 FIRST ROBOTICS COMPETITION MANUAL

PRE-CUT ONE-WRAP® CABLE CONTROL STRAPS AVAILABLE:

Size	Straps Per Reel
 3/4" x 5"	1440
 3/4" x 6"	1200
 3/4" x 8"	900
 3/4" x 12"	600
 3/4" x 18"	400
 1" x 9"	675
 1" x 12"	450
 1/2" x 10"	1170

IMPORTANT NOTICE TO PURCHASER

All statements, technical advice and recommendations contained herein are based on tests believed to be reliable, but the accuracy thereof is not guaranteed, and the following is made in lieu of all warranties, express or implied: Seller's and manufacturer's only obligation shall be to replace the quantity of product proven to be defective. Neither seller nor manufacturer shall be liable for any injury, loss or damage, direct or consequential, arising out of the use of or the inability to use the product. Before using, user shall determine the suitability of the product for his intended use and user assumes all risk and liability whatsoever in connection therewith. No statement or recommendation not contained herein shall have any force or effect unless in an agreement signed by officers of seller and manufacturer.

SALES OFFICES AND DISTRIBUTION CENTERS WORLDWIDE

Velcro USA Inc.
406 Brown Avenue
Manchester, NH 03108
Telephone: (603) 669-4892
Facsimile: (603) 669-9271
E-Mail: marketing@velcro.com

Velcro Canada Inc.
114 East Drive
Brampton, ONT, L6T 1C1, Canada
Telephone: (905) 791-1630
Facsimile: (905) 791-5329
E-Mail: canada@velcro.com

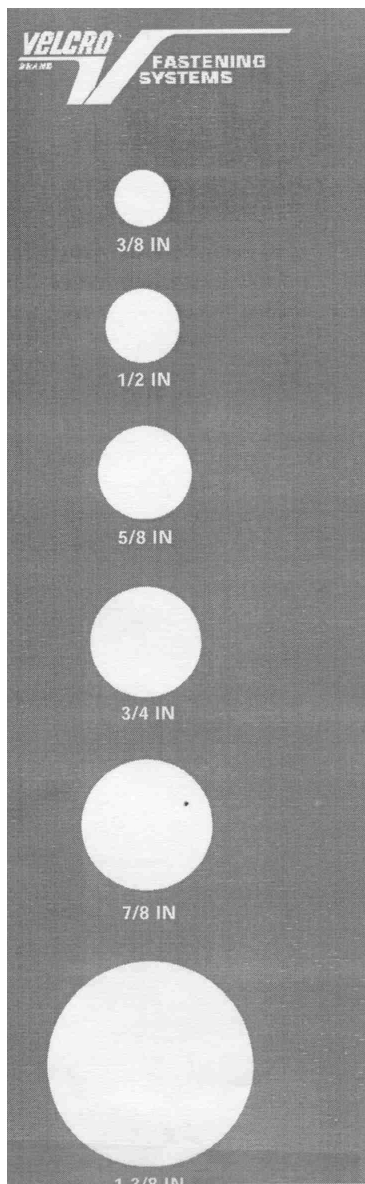
<http://www.velcro.com>

Velcro USA Inc. and Velcro Canada Inc. are ISO-9001 and QS9000 registered companies

For transportation sales, please contact Velcro Automotive Division, 1210 Souter, Troy, MI 48083 • (248) 583-6060



VELCRO®, ULTRA-MATE®, ONE-WRAP® and the FLYING-V® (DESIGN) are registered trademarks of the Velcro companies. ONE-WRAP® technology is protected under U.S. Patent #5,518,795. Patent #210550 pending in Canada. ©Velcro Industries B.V. Printed in USA. 2/98



VELCOIN®

WOVEN NYLON FASTENERS

- Pre-cut, circular VELCRO® brand Hook 88 and Loop 1000
- Rounded corners for easy assembly - no more lifted edges
- Variety of backings available to meet specific requirements
- Colors available: Black, White, Beige

PRESSURE SENSITIVE VELCOIN®

- Available with acrylic-based (SPECTRUM™ 0172) or an olefin-based (VECTOR™ 0115) adhesive
- Hook and Loop components sold separately
- Minimum order - 10 reels

Single Coin Across							
Width	3/8 IN	1/2 IN	5/8 IN	3/4 IN	7/8 IN	1 3/8 IN	1 7/8 IN
Number Of Coins Per Reel.	1880	1440	1200	1028	900	600	450

Multiple Coins Across							
Width	3/8 IN	1/2 IN	5/8 IN	3/4 IN	7/8 IN	1 3/8 IN	1 7/8 IN
Number Of Coins Per Reel.	NA	8640	6400	4112	3600	NA	NA
# of Multiple Coins Across		6 across	5 across	4 across	4 across		

RECOMMENDED ADHESIVES AND SUBSTRATES

Test Materials	VECTOR™ (0115)	SPECTRUM™ (0172)
Aluminum, unpainted	Excellent	Good
Steel, unpainted	Excellent	Excellent
Rigid vinyl	Good	Excellent

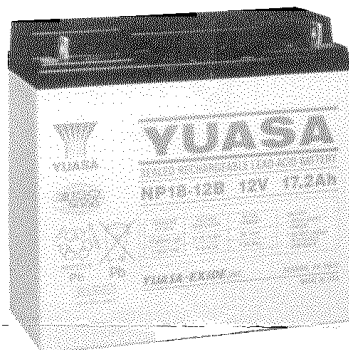
STANDARD BACK AND SOLVENT-ACTIVATED VELCOIN®

- Standard back available for sewing applications
- Solvent-activated available for sealing or heat-activated applications
- Hook and Loop components sold separately
- Minimum order - see below

WIDTH	1/2 IN	5/8 IN	3/4 IN	7/8 IN	1 3/8 IN	1 7/8 IN
MINIMUM ORDER	28,800	24,000	20,571	18,000	12,000	9,000



Sealed Rechargeable Lead-Acid Battery



NP18-12B
NP18-12BFR
12V, 17.2Ah

Specifications

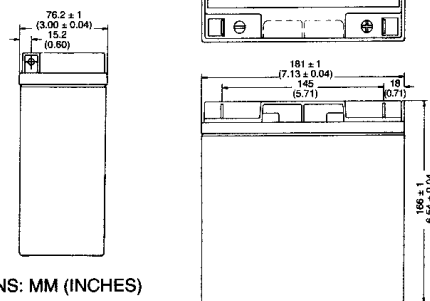
Nominal Voltage..... 12V
Nominal Capacity
20 hr. rate of 0.86 A to 10.50 V 17.2 Ah
10 hr. rate of 1.6 A to 10.50 V 16.0 Ah
5 hr. rate of 2.9 A to 10.20 V 14.5 Ah
1 hr. rate of 12.0 A to 9.60 V 12.0 Ah
Weight (approx.)..... 13.7 pounds
(6200 gs.)

Energy density (20 hr. rate)
..... 1.47 WH/cubic inch (90 WH/litre)
Specific energy (20 hr. rate)
..... 15.1 WH/pound (33.2 WH/kg)
Internal resistance of charged battery
..... 11 milliohms (approx.)
Maximum discharge current with standard terminals..... 100 amperes
Maximum short-duration discharge current 450 amperes
Operating temperature range
Charge..... 5°F to 122°F
(-15°C to 50°C)
Discharge..... -4°F to 140°F
(-20°C to 60°C)
Charge retention (shelf life) at 68°F (20°C)
1 month 97%
3 months 91%
6 months 85%

Life expectancy
Standby use..... 3 to 5 years
Cycle use (approx.)
100% depth of discharge 180 cycles
50% depth of discharge 400 cycles
30% depth of discharge ... 1200 cycles

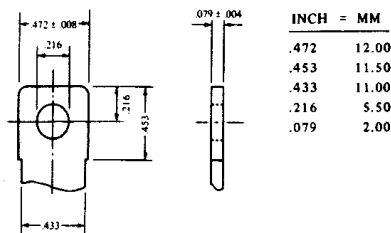
Sealed construction
Can be operated, charged or stored in any position without leakage.
Standard terminal..... Bolt fastened terminal
Housing material..... ABS Resin
or ABS Flame Retardant (UL94-V0)
Hardware..... 2- M5-8 X 12mm Bolt w/nuts, lock washer & flat washer

Dimensions



DIMENSIONS: MM (INCHES)

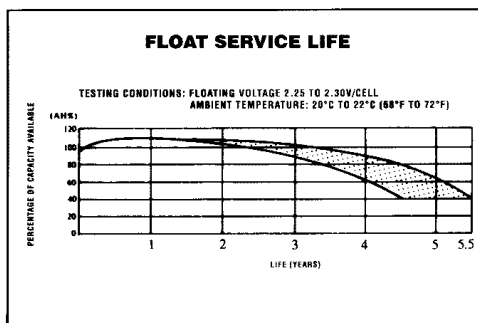
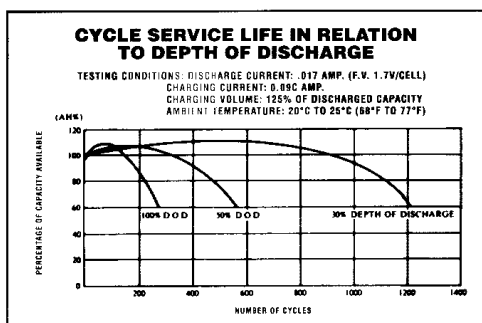
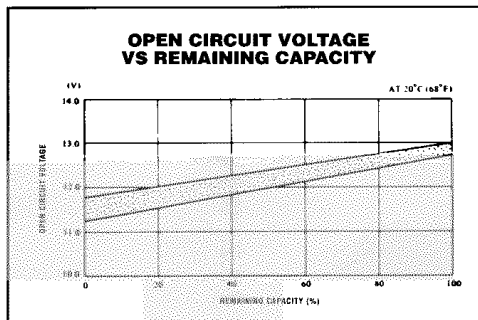
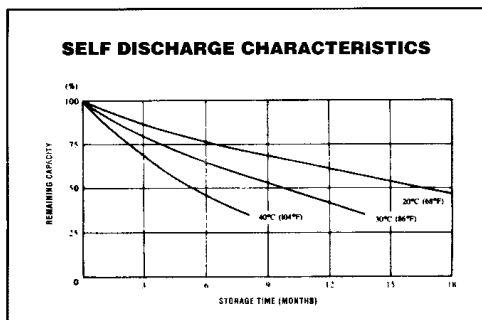
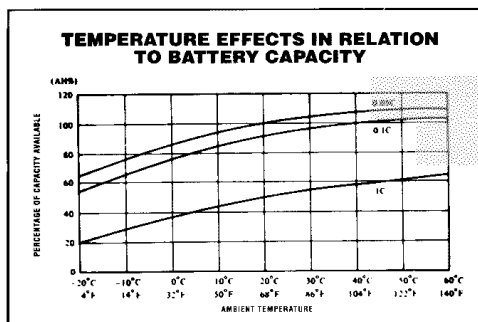
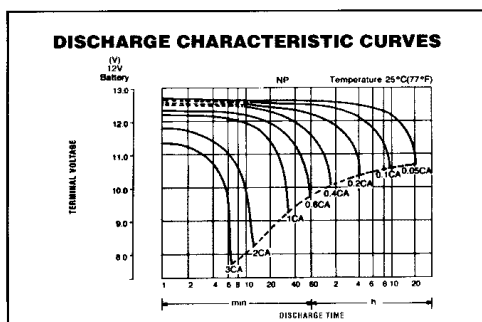
Terminal



DIMENSIONS: INCHES

UL RECOGNIZED BY UL, File No. MH 16464

YUASA
EXIDE, INC.



When the battery will be used by the current in excess of 3C, consult with Yuasa-Exide prior to use.

MADE IN THE USA

CHARGING METHODS (At 20°C)

Cycle use: Maximum charging current 0.25C

Charging voltage 14.4 TO 15.0V

Standby use: Float charging voltage 13.50 to 13.80V

CAUTION

- Avoid short circuit
- Do not charge in a sealed container.

Distributed by:



When ordering new batteries, also remember to properly recycle your old lead batteries. Most federal and state regulations require lead-acid batteries be recycled. Yuasa-Exide's nationwide service organization can arrange pickup, transportation to and recycling at any one of our company affiliated smelters. Call 1-800-972-7372 for more information.

**YUASA™
EXIDE, INC.**

Sales Offices

Eastern Region: 201-641-5900 • 1-800-962-1287
FAX 201-641-8720

Western Region: 562-949-4266 • 1-800-423-4667
FAX 562-949-5527

Corporate Office: P.O. Box 14145, Reading, PA 19612-4145
FAX 610-372-8613

Visit us on the web at: www.yuasa-exide.com

Printed 2/98 - 4M
Rev. - 2/98

Printed in USA



January 5, 1999

To Whom It May Concern:

Subject: NP Battery Series Packaging Regulations

On behalf of Yuasa, Inc., I hereby certify that all Yuasa NP series batteries conform to the non-spillable battery requirements as established in the Code of Federal Regulations 49 (CFR 49), revised 10/1/98, section 173.159 (d), the International Air Transport Association (IATA), 40th Edition, Packing Instruction 806 and the International Maritime Dangerous Goods code (IMDG code), page 8121. Therefore, the basic description for all NP batteries is:

Batteries, wet, non-spillable, 8, UN2800, PG III

In addition, I further certify that all NP series batteries conform to IATA special provision A67 and IMDG code page 8121 for non-spillable batteries, which classifies them as non-regulated goods provided their terminals are packed in a manner so as to protect them from short circuits, whenever those regulations apply.

Sincerely,

A handwritten signature in black ink, appearing to read "Larry Burkert".

Larry Burkert
Yuasa, Inc.
Packaging Engineer



12070 Telegraph Road
Suite 100
Santa Fe Springs, CA 90670
310/949-4266
1-800/423-4667
Fax 310/949-5527

MAY 5, 1995

To: Customers Of Yuasa-Exide, Inc. NP Series Batteries

Subject: Air Transportation Requirements In Accordance With
The International Air Transport Association (I.A.T.A.)

We hereby certify that all Yuasa NP Series valve regulated lead acid batteries conform to the UN2800 classification as "Batteries, wet, non-spillable, electric storage".

We further certify that under I.A.T.A. Dangerous Goods Regulations, 35th Edition, Jan. 1, 1994, UN2800, Yuasa NP Series batteries meet the requirements and conform to special provision A67 classifying them as non-dangerous goods. The NP Series batteries are therefore exempt from the subject regulations for dangerous goods and are acceptable for transport on both cargo and passenger aircraft.

For reference:

I.A.T.A. Dangerous Goods Regulations, 35th Edition, Jan. 1, 1994 Section 4.4,
Special Provisions:

- A67) Non-spillable batteries are considered to be nondangerous if, at a temperature of 55 deg.C (130 deg.F), the electrolyte will not flow from a ruptured or cracked case and there is no free liquid to flow and if, when packaged for transport, the terminals are protected from short circuit.

YUASA-EXIDE, INC.



9/23/96

NOTICE TO ALL CUSTOMERS

SUBJECT: MATERIAL SAFETY DATA SHEET - LEAD-ACID BATTERY

As part of our ongoing commitment to provide customers with current safety and health information on our products, Yuasa-Exide, Inc. has developed the attached comprehensive Material Safety Data Sheet (MSDS) for its lead-acid batteries. This MSDS supersedes all previous documents for lead-acid batteries. *→ DATED 6/96*

The enclosed MSDS has been prepared in accordance with the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200) and is intended to assist you in complying with your obligations under the Standard. Please make this information available to your employees and any others who may handle or come into contact with our product.

Should you have any questions, please contact your Yuasa-Exide representative.

2400 Bernville Road Reading, PA 19605
P.O. Box 14145 Reading, PA 19612-4145
610/208-1991

THE 2001 FIRST ROBOTICS COMPETITION MANUAL



MATERIAL SAFETY DATA SHEET

Revised 8/96
Page 1 of 7

I. PRODUCT IDENTIFICATION

<u>Chemical/Trade Name (as used on label)</u>	<u>Chemical Family/Classification</u>
Lead-Acid Battery	Electric Storage Battery
<u>Manufacturer's Name/Address</u>	<u>Telephone</u>
Yuasa-Exide, Inc. P.O. Box 14145 Reading, PA 19612-4145	For information and emergencies, contact Yuasa-Exide., Environmental Resources Dept. (610) 208-1975. 24-hour Emergency Response Contact: CHEMTREC (800) 424-9300

I. HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

<u>Components</u>	<u>CAS Number</u>	<u>Approximate % by Wt. or Vol.</u>	<u>Air Exposure Limits (ug/m³)</u>		
			<u>OSHA</u>	<u>ACGIH</u>	<u>NIOSH</u>
Inorganic lead compound:					
Lead	7439-92-1	60	50	150	100
Antimony	7440-38-0	2	500	500	—
Arsenic	7440-38-2	0.2	10	200	—
Calcium	7440-70-2	0.2	—	—	—
Tin	7440-31-5	0.2	2000	2000	—
Electrolyte (sulfuric acid)	7664-93-9	10-30	1000	1000	1000
Case Material:		5-10	N/A	N/A	N/A
Polypropylene	9003-07-0				
Polystyrene	9003-53-6				
Styrene Acrylonitrile	9003-54-7				
Acrylonitrile Butadiene Styrene	9003-56-9				
Styrene Butadiene	9003-55-8				
Polyvinylchloride	9002-86-2				
Polycarbonate	—				
Hard Rubber	—				
Polyethylene	—				
Other					
Silicon dioxide (gel cell batteries only)	60676-86-0	10	N/A	N/A	N/A
Sheet Molding Compound (glass-reinforced polyester)	—	10	N/A	N/A	N/A

DTE: Inorganic lead and electrolyte (sulfuric acid) are the primary components of every battery manufactured by Yuasa-Exide, Inc. Other ingredients may be present dependent upon battery type. Contact your Yuasa-Exide representative for additional information.

THE 2001 FIRST ROBOTICS COMPETITION MANUAL

III. PHYSICAL DATA

Electrolyte:

Boiling Point: 203 - 240°F Specific Gravity (H₂O = 1): 1.215 to 1.350

Melting Point: Not Applicable Vapor Pressure (mm Hg): 10

Solubility in Water: 100% Vapor Density (AIR = 1): Greater than 1

Evaporation Rate
(Butyl acetate = 1) Less Than 1 % Volatiles by Weight: Not Applicable

Appearance and Odor: Manufactured article; no apparent odor. Electrolyte is a clear liquid with a sharp, penetrating, pungent odor.

IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point: Not Applicable Flammable Limits: LEL = 4.1% (Hydrogen Gas) UEL = 74.2%

Extinguishing media: CO₂; foam; dry chemical

Special Fire Fighting Procedures: If batteries are on charge, shut off power. Use positive pressure, self-contained breathing apparatus. Water applied to electrolyte generates heat and causes it to spatter. Wear acid-resistant clothing.

Unusual Fire and Explosion hazards: Highly flammable hydrogen gas is generated during charging and operation of batteries. To avoid risk of fire or explosion, keep sparks or other sources of ignition away from batteries. Do not allow metallic materials to simultaneously contact negative and positive terminals of cells and batteries. Follow manufacturer's instructions for installation and service.

V. REACTIVITY DATA

Stability: Stable X
 Unstable _____

Conditions to Avoid: Prolonged overcharge; sources of ignition

Incompatibility: (materials to avoid)

Sulfuric acid: Contact with combustibles and organic materials may cause fire and explosion. Also reacts violently with strong reducing agents, metals, sulfur trioxide gas, strong oxidizers and water. Contact with metals may produce toxic sulfur dioxide fumes and may release flammable hydrogen gas.

Lead compounds: Avoid contact with strong acids, bases, halides, halogenates, potassium nitrate, permanganate, peroxides, nascent hydrogen and reducing agents.

Hazardous Decomposition Products:

Sulfuric acid: Sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, hydrogen.

Lead compounds: High temperatures likely to produce toxic metal fume, vapor or dust; contact with strong acid or base or presence of nascent hydrogen may generate highly toxic arsine gas.