

**MATERIAL SAFETY DATA SHEET**

<b>SECTION I: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION</b>	
<b>PRODUCT IDENTITY:</b>  Sealed Lead Calcium Battery CDID: Revolution	<b>MANUFACTURER NAME:</b> C & D Technologies, Inc.  <b>ADDRESS:</b> 1400 Union Meeting Road P. O. Box 3053 Blue Bell, PA 19422-0858
<b>EMERGENCY:</b> (610) 828-9309 <b>24 HOUR EMERGENCY TELEPHONE:</b> (CHEM TEL) 1-800-255-3924	<b>TELEPHONE:</b> (215) 619-2700

<b>SECTION II: COMPOSITION / INFORMATION ON INGREDIENTS</b>				
<b>NOTE:</b> The C&D "Revolution" batteries are sealed, recombinant design. Under normal use and handling the customer has no contact with the internal components of the battery or the chemical hazards. Under normal use and handling these batteries do not emit regulated or hazardous substances.				
HAZARDOUS COMPONENT	CAS#	OSHA PEL	ACGIH TLV	% BY WEIGHT
*Lead, Lead compounds	7439-92-1	0.05mg/m3	0.05mg/m3	58-79%
*Sulfuric Acid	7664-93-9	1.0mg/ m3	1.0mg/ m3	8-9%
*Copper	7440-50-8	1.0mg/m3	1.0mg/m3	< .01%
Tin	7440-31-5	2.0mg/m3	2.0mg/m3	< .1%
Aluminum	7429-90-5	15.0mg/m3	10.0mg/m3	< .01%
NON-HAZARDOUS INGREDIENTS				
Water	7732-18-5	N/A	N/A	3%
Inert Components	N/A	N/A	N/A	9-31%
SECTION 313 (40 CFR 372) LISTED TOXIC CHEMICALS ARE PRECEDED BY AN *.				

<b>SECTION III: HAZARDS IDENTIFICATION</b>	
<b>APPEARANCE AND ODOR:</b> Colorless, Oily Fluid, Vapors are Colorless; Acrid odor when hot or charging.	
<b>RATING CODES:</b> 0=Insignificant 1=Slight 2=Moderate 3=High 4=Extreme	
<b>HMIS RATING:</b> Health: 3 Flammability: 0 Reactivity: 2 Other: 0	
<b>NFPA RATING:</b> Health: 3 Flammability: 0 Reactivity: 2 Other: 0 Sulfuric acid is water-reactive if concentrated.	
<b>ROUTES OF ENTRY:</b> Inhalation X Skin X Ingestion X	<b>TARGET ORGANS:</b> Skin, Eyes, Upper Respiratory Tract
<b>HEALTH HAZARDS (ACUTE AND CHRONIC):</b> <b>ACUTE:</b> Tissue destruction on contact. May cause 2nd and 3rd degree burns or blindness. Ingestion will cause corrosive burns on contact. May be fatal if swallowed. <b>CHRONIC:</b> Inhalation of mists may cause upper respiratory irritation.	
<b>SIGNS AND SYMPTOMS:</b> Irritation and burning of exposed tissues.	
<b>MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:</b> Respiratory disorders may be aggravated by prolonged inhalation of mists.	
<b>California Proposition 65 Warning</b> – Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Batteries also contain other chemicals known to the State of California to cause cancer. Wash hands after handling.	

<b>SECTION IV: FIRST AID MEASURES</b>	
<b>EMERGENCY AND FIRST AID PROCEDURES:</b>	
<b>SKIN / EYES</b>	<b>INGESTION</b>
<ul style="list-style-type: none"> <li>◆ Flush with water for 15 minutes</li> <li>◆ Remove contaminated clothing</li> <li>◆ If irritation continues, seek medical attention.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Do not induce vomiting</li> <li>◆ Drink large quantities of milk or water</li> <li>◆ Give CPR if breathing has stopped</li> <li>◆ Seek medical attention immediately</li> </ul>

<b>SECTION V: FIREFIGHTING MEASURES</b>			
<b>FIRE AND EXPLOSIVE PROPERTIES:</b>			
Flash Point: N/A	Flammable Limits (as H <sub>2</sub> gas):	LEL: 4%	UEL: 74%
UNUSUAL FIRE AND EXPLOSION HAZARDS: Hydrogen gas may be present when used in a battery. Hydrogen gas and acid mist is generated upon overcharge or in fire. Ventilate area.			
<b>EXTINGUISHING MEDIA:</b> Class ABC or CO <sub>2</sub> . Caution should be taken not to use CO <sub>2</sub> directly on the battery cell as the thermal shock may cause cracking of the battery case and release of battery electrolyte.			
SPECIAL FIREFIGHTING PROCEDURES: Ventilate the area well. SCBA and acid protective clothing are recommended			

<b>SECTION VI: ACCIDENTAL RELEASE MEASURES</b>
<b>STEPS TO BE TAKEN IF BATTERY IS BROKEN:</b> Neutralize any spilled electrolyte or exposed battery parts with soda ash or sodium bicarbonate until fizzing stops. pH should be neutral at 6-8. Collect residue and place in a suitable container. Residue may be hazardous waste. When neutralized, the spill is non-hazardous. Keep untrained individuals away from the spilled material. Place the broken battery in a heavy gauge plastic bag or other non-metallic container. Provide adequate ventilation, hydrogen gas may be given off during neutralization.

<b>SECTION VII: HANDLING AND STORAGE</b>
Store in a cool, dry area away from combustibles. Do not store in sealed, unventilated areas. Avoid overheating and overcharging. Do not use organic solvents or other than recommended chemical cleaners on the batteries.

<b>SECTION VIII: EXPOSURE CONTROLS / PERSONAL PROTECTION</b>
<b>ENGINEERING CONTROLS:</b> General room ventilation is sufficient during normal use and handling. Do not install these batteries in a sealed, unventilated area.
<b>PERSONAL PROTECTIVE EQUIPMENT (WHEN HANDLING BATTERY ACID):</b>
<b>Eye Protection</b> = chemical goggles or safety glasses with sideshields and a full-face shield.
<b>Protective Gloves</b> = rubber or neoprene
<b>Respiratory Protection</b> = NIOSH approved acid mist respirator, if OSHA PEL is exceeded or respiratory or Irritation occurs.
<b>Other Protective Equipment</b> = acid resistant apron or clothes.
<b>WORK PRACTICES:</b> Do not wear metallic jewelry when working with batteries. Use non-conductive tools only. Discharge static electricity prior to working on a battery. Maintain an eyewash, fire extinguisher and emergency communication device in the work area.

<b>SECTION IX: PHYSICAL AND CHEMICAL PROPERTIES</b>	
<b>ACID: Boiling Point:</b> 235 F	<b>Appearance / Odor:</b> At normal temperatures colorless, oily fluid / acrid odor when hot.
<b>Vapor Density:</b> (air=1):>1	<b>Evaporation Rate:</b> (water=1):<1 <b>Solubility in water:</b> 100%
	<b>Vapor Pressure:</b> 1mm @ 145.8 <b>Melting Point (unit):</b> N/A
	<b>Specific Gravity (contained in the Battery):</b> 1.290+/-0.010

## SECTION X: STABILITY AND REACTIVITY

**STABILITY:** This battery and contents are stable.

**CONDITIONS TO AVOID:** Overheating, overcharging which result in acid mist Hydrogen generation.

**INCOMPATIBILITY (MATERIALS TO AVOID):** Strong alkaline materials, conductive metals, organic solvents, sparks or open flame.

**HAZARDOUS DECOMPOSITION OR BYPRODUCTS:** Hydrogen gas may be generated in an overcharged condition, in fire or at very high temperatures. In fire may emit CO, CO<sub>2</sub> and Sulfur Oxides.

**HAZARDOUS POLYMERIZATION WILL NOT OCCUR.**

## SECTION XI: TOXICOLOGICAL INFORMATION - SULFURIC ACID

(Under normal use and handling of this product there is no exposure to the lead contents.)

<b>LD 50:</b>	Administration Route: <b>Oral</b>	Dose: <b>2140mg/kg</b>	Test Animal: <b>Rat</b>
<b>LDLo:</b>	Administration Route: <b>Unreported</b>	Dose: <b>135mg/kg</b>	Test Animal: <b>Man</b>
<b>LC50:</b>	Administration Route: <b>Inhalation</b>	Dose: <b>510mg/m<sup>3</sup></b>	Test Animal: <b>Rat</b>

**CARCINOGENICITY:** The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mists containing sulfuric acid" as a category 1 carcinogen (inhalation), a substance that is carcinogenic to humans. "The National Toxicology Program (NTP) has designated strong inorganic sulfuric mists as a known human carcinogen." This classification does not apply to the liquid forms of sulfuric acid contained within the battery. Inorganic acid mist (sulfuric acid mist) is generated in very nominal levels at the end of charging. 2-3 room air changes is sufficient for control of this emission. However, misuse of the product, such as overcharging, may result in the generation of sulfuric acid mist at higher levels.

## SECTION XII: ECOLOGICAL INFORMATION

Lead and its compounds can pose a threat if release to the environment. See waste disposal method in Section XIII.

## SECTION XIII: DISPOSAL CONSIDERATIONS

**WASTE DISPOSAL METHOD:** This battery is recyclable. It is illegal to dispose of lead-acid batteries by any means other than recycling. C&D provides an environmentally responsible nation wide lead acid battery collection and recycling program. Contact your local C&D sales representative for more information.

**HAZARDOUS WASTE CODES:** D002, D008

## SECTION XIV: TRANSPORTATION INFORMATION

FOR DOMESTIC, CANADIAN, AND EXPORT SHIPMENTS:

UN OR NA IDENTIFICATION: UN-2794

PROPER DOT SHIPPING NAME: Batteries, Wet, Filled with Acid, Electric Storage

HAZARD CLASS: 8	PACKING GROUP: III	LABEL: Corrosive
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## SECTION XV: REGULATORY INFORMATION

See 29 CFR 1910.178(g)

## SECTION XVI: OTHER INFORMATION

**The information herein is given in good faith, but no warranty, expressed or implied, is made.**

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