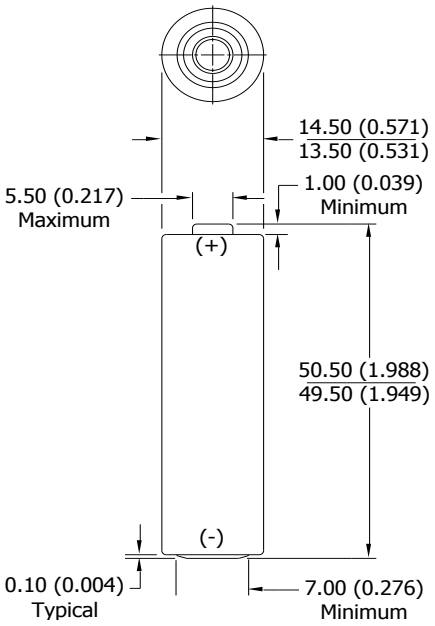
ENERGIZER L91

Ultimate Lithium

AA

Industry Standard Dimensions

mm (inches)



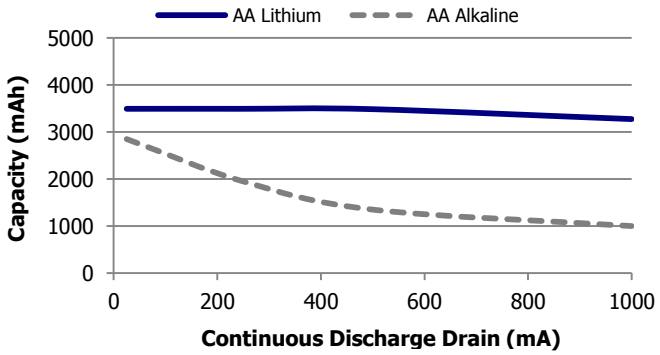
Specifications

Classification:	"Cylindrical Primary Lithium"
Chemical System:	Lithium/Iron Disulfide (Li/FeS_2)
Designation:	ANSI 15-LF, IEC-FR6
Nominal Voltage:	1.5 Volts
Sizing Compatibility	EA91, E91, NH15, 1215
Storage Temp:	-40°C to 60°C (-40°F to 140°F)
Operating Temp:	-40°C to 60°C (-40°F to 140°F)*
Typical Weight:	15 grams (0.5 oz.)
Typical Volume:	8.0 cubic centimeters (0.49 cubic inch)
Max Discharge:	2.5 Amps Continuous
(single battery only)	4.0 Amps Pulse (2 sec on / 8 sec off)
Max Rev Current:	2 uA
Lithium Content:	Less than 1 gram
Typical IR:	120 to 240 milliohms (depending on method)
Shelf Life:	20 years at 21°C
Shipping:	Please refer to PSDS Document
Certifications:	This battery has Underwriters Laboratories component recognition (MH29980) · Compliant to intrinsic safety 710024 · II 1G Ex ia IIC Ga Baseefa 14ATEX0107U

***All data shown tested at 21°C unless otherwise stated.**

Milliamp-Hours Capacity

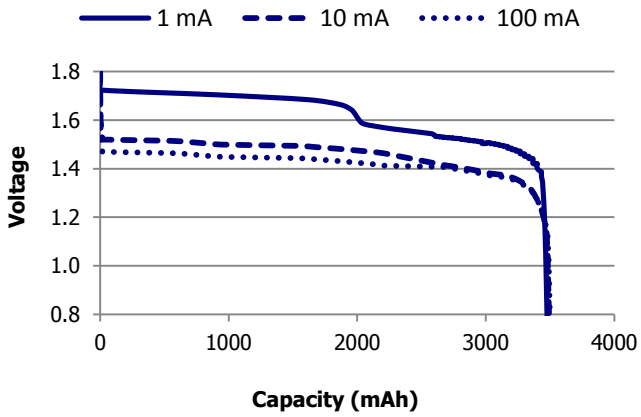
Constant Current Discharge to 0.8 Volts



(alkaline shown for comparison)

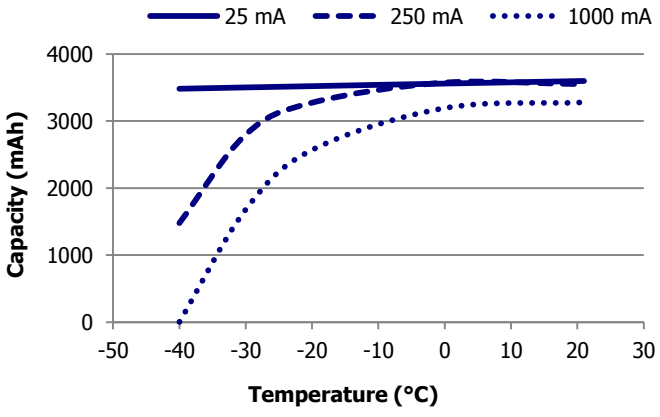
Discharge Profile

Constant Current Discharge



Temperature Effects on Capacity

Constant Current Discharge



Important Notice

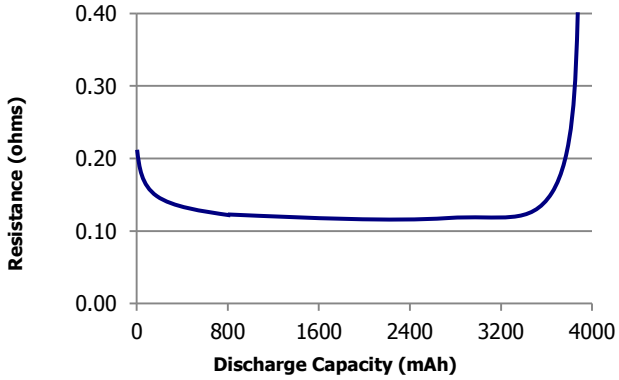
This datasheet contains typical information specific to products manufactured at the time of its publication.

ENERGIZER L91

AA

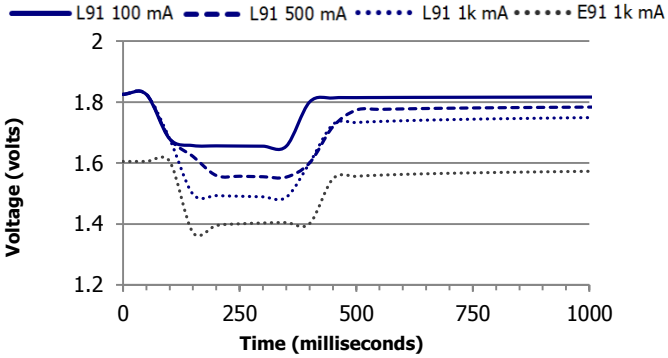
Internal Resistance Profile

Cell Ohmic Resistance - Dual Pulse Method



Pulse Response

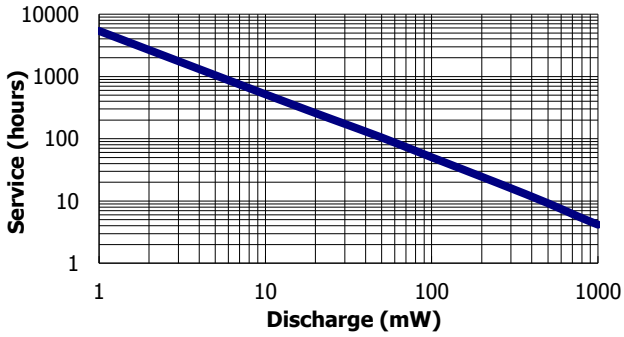
Open Circuit Voltage - 100/500/1k mA Pulse



(E91 AA alkaline shown for comparison)

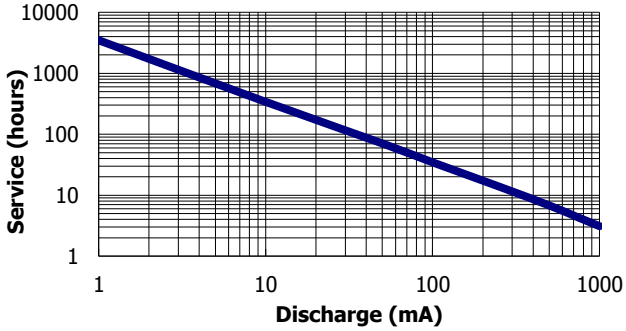
Constant Power Performance

Typical Characteristics to 0.8 Volts



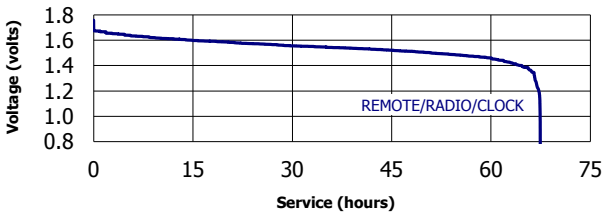
Constant Current Performance

Typical Characteristics to 0.8 Volts



Application Tests

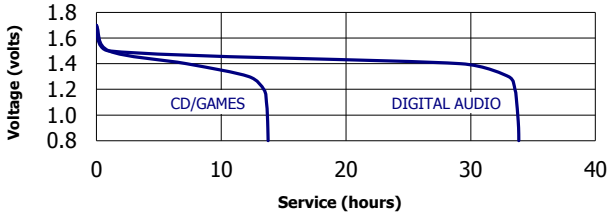
REMOTE/RADIO /CLOCK
50 mA 1 hr/8 hrs day



Application Tests

CD/GAMES
250 mA 1 hr/day

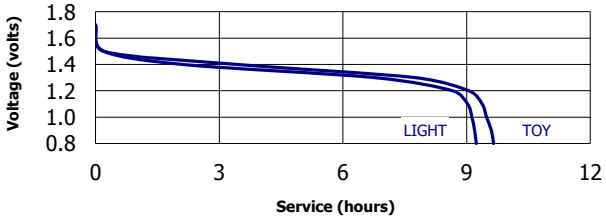
DIGITAL AUDIO
100 mA 1 hr/day



Application Tests

PORTABLE LIGHTING
3.3 ohm LIF

TOY
3.9 ohm 1 hr/day



Industry Standard Tests

PERSONAL GROOMING
750 mA 2 min/hr 8 hrs/day

DIGITAL CAMERA
1.5/.65K mW 2/.1/27.9s 10X

PRODUCT SAFETY DATA SHEET

PRODUCT NAME: Energizer Battery **Type No.:** L91 (AA), L92 (AAA) **Volts:** 1.5

TRADE NAMES: ULTIMATE **Approximate Weight:** 7.6 g. (L92) – 15 g. (L91)

CHEMICAL SYSTEM: Lithium Iron Disulfide **Designed for Recharge:** No **Document Number:** 12003-A

SECTION 1- MANUFACTURER INFORMATION

Energizer Battery Manufacturing, Inc.
25225 Detroit Rd.
Westlake, OH 44145

Telephone Number for Information:
800-383-7323 (USA / CANADA)

Date Prepared: January 2017

SECTION 2 – HAZARDS IDENTIFICATION

GHS classification: N/A

Signal Word: N/A

Hazard Classification: N/A

Under normal conditions of use, the battery is hermetically sealed.

Ingestion: Swallowing a battery can be harmful.
Inhalation: Contents of an open battery can cause respiratory irritation.
Skin Contact: Contents of an open battery can cause skin irritation.
Eye Contact: Contents of an open battery can cause severe irritation.

SECTION 3 - INGREDIENTS

IMPORTANT NOTE: The battery should not be opened or burned. Exposure to the ingredients contained within or their combustion products could be harmful.

MATERIAL OR INGREDIENT	PEL (OSHA)	TLV (ACGIH)	% / wt.
Carbon Black (CAS# 1333-86-4)	3.5 mg/m^3 TWA	3.5 mg/m^3 TWA	0-4
1,2 Dimethoxymethane (CAS# 110-71-4)	None established	None established	2-4
1,3 Dioxolane (CAS# 646-06-0)	None established	20 ppm TWA	5-9
Graphite (CAS# 7782-42-5)	15 mg/m^3 TWA (total dust) 5 mg/m^3 TWA (respirable fraction)	2 mg/m^3 TWA (respirable fraction)	0-4
Iron Disulfide (CAS# 1309-36-0)	None established	None established	28-38
Lithium or Lithium Alloy	None established	None established	6.3-6.6 / AA 5.4-5.5 / AAA
Lithium Iodide	None established	None established	0.3-3

Non-Hazardous Components Steel (iron CAS# 65997-19-5) Plastic and Other	None established None established	None established None established	18-22 Balance

SECTION 4 – FIRST AID MEASURES

Ingestion: Do not induce vomiting or give food or drink. Seek medical attention immediately. CALL NATIONAL BATTERY INGESTION HOTLINE for advice and follow-up (202-625-3333) collect day or night.
Inhalation: Provide fresh air and seek medical attention.
Skin Contact: Remove contaminated clothing and wash skin with soap and water.
Eye Contact: Immediately flush eyes thoroughly with water for at least 15 minutes, lifting upper and lower lids, until no evidence of the chemical remains. Seek medical attention.

Note: Carbon black is listed as a possible carcinogen by International Agency for Research on Cancer (IARC).

SECTION 5- FIRE FIGHTING MEASURES

In case of fire where lithium batteries are present, flood area with water or smother with a Class D fire extinguishant appropriate for lithium metal, such as Lith-X. Water may not extinguish burning batteries but will cool the adjacent batteries and control the spread of fire. Burning batteries will burn themselves out. Virtually all fires involving lithium batteries can be controlled by flooding with water. However, the contents of the battery will react with water and form hydrogen gas. In a confined space, hydrogen gas can form an explosive mixture. In this situation, smothering agents are recommended. A smothering agent will extinguish burning lithium batteries.

Emergency Responders should wear self-contained breathing apparatus. Burning lithium-iron disulfide batteries produce toxic and corrosive lithium hydroxide fumes and sulfur dioxide gas.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

To cleanup leaking batteries:

Ventilation Requirements: Room ventilation may be required in areas where there are open or leaking batteries.
Respiratory Protection: Avoid exposure to electrolyte fumes from open or leaking batteries.
Eye Protection: Wear safety glasses with side shields if handling an open or leaking battery.
Gloves: Use neoprene or natural rubber gloves if handling an open or leaking battery.
Battery materials should be disposed of in a leak-proof container.

SECTION 7 - HANDLING AND STORAGE

Storage: Store in a cool, well ventilated area. Elevated temperatures can result in shortened battery life. In locations that handle large quantities of lithium batteries, such as warehouses, lithium batteries should be isolated from unnecessary combustibles.

Mechanical Containment: If potting or sealing the battery in an airtight or watertight container is required, consult your Energizer Battery Manufacturing, Inc. representative for precautionary suggestions. Do not obstruct safety release vents on batteries. Encapsulation of batteries will not allow cell venting and can cause high pressure rupture.

Handling: Accidental short circuit for a few seconds will not seriously affect the battery. Prolonged short circuit will cause the battery to lose energy, generate significant heat and can cause the safety release vent to open. Sources of short circuits include jumbled batteries in bulk containers, metal jewelry, metal covered tables or metal belts used for assembly of batteries into devices. Damaging a lithium battery may result in an internal short circuit.
The contents of an open battery, including a vented battery, when exposed to water, may result in a fire and/or explosion.
Crushed or damaged batteries may result in a fire.
If soldering or welding to the battery is required, consult your Energizer representative for proper precautions to prevent seal damage or short circuit.

Charging: This battery is manufactured in a charged state. It is not designed for recharging. Recharging can cause battery leakage or, in some cases, high pressure rupture. Inadvertent charging can occur if a battery is installed backwards.

Labeling: If the Energizer label or package warnings are not visible, it is important to provide a package and/or device label stating:

WARNING: Battery can explode or leak and cause burns if installed backwards, disassembled, charged, or exposed to water, fire or high temperature.

Where accidental ingestion of small batteries is possible, the label should include:

WARNING: (1) Keep away from small children. If swallowed, promptly see doctor; have doctor phone (202) 625-3333 collect. (2) Battery can explode or leak and cause burns if installed backwards, disassembled, charged, or exposed to water, fire or high temperature.

SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation Requirements: Not necessary under normal conditions. / **Respiratory Protection:** Not necessary under normal conditions.

Eye Protection: Not necessary under normal conditions. / **Gloves:** Not necessary under normal conditions.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance (physical state, color, etc.):	Solid object
Upper Explosive Limits:	Not applicable for an Article
Lower Explosive Limits	Not applicable for an Article
Odor	No odor
Vapor Pressure (mm Hg @ 25°C)	Not applicable for an Article
Odor Threshold	No odor
Vapor Density (Air = 1)	Not applicable for an Article
pH	Not applicable for an Article
Density (g/cm^3)	1.7 -2.0
Melting point/Freezing Point	Not applicable for an Article
Solubility in Water (% by weight)	Not applicable for an Article
Boiling Point @ 760 mm Hg (°C)	Not applicable for an Article
Flash Point	Not applicable for an Article
Evaporation Rate (Butyl Acetate = 1)	Not applicable for an Article
Flammability	Not applicable for an Article
Partition Coefficient	Not applicable for an Article
Auto-ignition Temperature	Not applicable for an Article
Decomposition Temperature	Not applicable for an Article
Viscosity	Not applicable for an Article

SECTION 10 – STABILITY AND REACTIVITY

Lithium iron disulfide batteries contain no sulfides or cyanides and they do not meet any other reactivity criteria including "reacts violently with water" and therefore do not meet any of the criteria established in 40 CFR 261.2 for reactivity.

SECTION 11 – TOXICOLOGICAL INFORMATION

Under normal conditions of use, lithium iron disulfide batteries are non-toxic.

SECTION 12 – ECOLOGICAL INFORMATION

Issues such as ecotoxicity, persistence and bioaccumulation are not applicable for articles.

SECTION 13 – DISPOSAL CONSIDERATIONS

Lithium iron disulfide batteries are not hazardous waste per the United States Resource Conservation and Recovery Act (RCRA) - 40 CFR Part 261 Subpart C. Dispose of in accordance with all applicable federal, state and local regulations.

SECTION 14 – TRANSPORT INFORMATION

In general, all batteries in all forms of transportation (ground, air, or ocean) must be packaged in a safe and responsible manner. Regulatory concerns from all agencies for safe packaging require that batteries be packaged in a manner that prevents short circuits and be contained in "strong outer packaging" that prevents spillage of contents. All original packaging for Energizer lithium batteries are compliant with these regulatory concerns.

Energizer lithium-iron disulfide batteries are exempt from the classification as dangerous goods as they meet the requirements of the special provisions listed below. (Essentially, they are properly packaged and labeled, contain less than 1 gram of lithium and pass the tests defined in UN model regulation section 38.3).

Regulatory Body	Special Provisions
ADR	188, 230, 310, 636, 656
IMDG	188, 230, 310, 957
UN	UN 3090, UN 3091
US DOT	29, A54, A100, A101
IATA 58th Edition, ICAO	Packaging Instructions 968 – 970

Energizer is registered with CHEMTREC. In the event of an incident during transport call 1-800-424-9300 (North America) or 1-703-527-3887 (International).

A global lithium label chart is provided below to summarize the current global labeling requirements.

Label Summary Chart

Shipping Mode	Li content	Net quantity wt. of batteries per package	Battery Type			
AIR	0.3g to ≤1g/cell 0.3g to ≤2g/ battery	≤2.5 kg	L91, L92, L522	YES	YES	YES
	≤0.3g/cell	≤2.5kg	All Li Coin and 2L76	NO	YES	YES
	≤0.3g/cell	>2.5kg	All Li Coin and 2L76	YES	YES	YES
Land/ Sea only	All	All	All	NO	YES	YES

SECTION 15 - REGULATORY INFORMATION

Outside of the transportation requirements noted in Section 14, lithium iron disulfide batteries marketed by Energizer Battery Manufacturing, Inc. are not regulated.

SARA/TITLE III - As an article, this battery and its contents are not subject to the requirements of the Emergency Planning and Community Right-To-Know Act.

SECTION 16 - OTHER INFORMATION

None.

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www.Energizer.com

January 16, 2017

REACH Directive

On June 1, 2007 the European Union REACH regulation (EC) No 1907/2006 went into force. The REACH regulation deals with the **R**egistration, **E**valuation, **A**uthorization, and Restriction of **Ch**emical substances.

What is REACH?

REACH addresses the production and use of chemical substances and their potential impacts on human health and the environment. REACH requires all companies manufacturing or importing chemical substances into the European Union in quantities of one ton or more per year to register these substances with the European Chemicals Agency (ECHA). There are over 143,000 chemical substances registered with the ECHA.

Substances of Very High Concern

REACH also regulates substances which are of particular concern because they may have very serious effects on human health and the environment. These substances are listed on the "Candidate List of Substances of Very High Concern for Authorization" (SVHC) Annex XIV. If a substance listed on the candidate list above a concentration of 0.1% by weight is contained in articles, this may trigger additional obligations for companies producing, importing, and supplying these articles.

Batteries (except lithium type), lights, and chargers sold by Energizer do not contain any of the substances listed in the candidate list of substances of very high concern included in Annex XIV (list of substances subject to authorization).

About Bis(2-methoxyethyl) ether (Diglyme) CAS#111-96-6: In August 2014, this substance was added to the Authorization list (Annex XIV). This substance can be used as a solvent in lithium batteries. Energizer does not place on the market any lithium batteries that use this substance as a solvent. Therefore, no Energizer battery uses a substance listed in Annex XIV.

About ENERGIZER Lithium primary batteries: The information here after is provided per article 33 of REACH regulation 1907/2006 from European Commission:

EGDME (Ethylene Glycol Dimethyl Ether) was under review to be placed on the list of substances that could become candidate to Authorization for a specific use.

1. Substance name: 1,2 DimethoxyEthane
2. EC Number: 203-794-9
3. CAS Number: 110-71-4

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4. Content: above 0,1% weight by weight
5. EGMDE use description: Incorporated in Lithium Primary Batteries as electrolyte solvent, is not released during normal or reasonably foreseeable conditions of use of batteries.
6. Conditions of use of batteries remain unchanged: Do not open, do not disassemble, do not damage, do not expose to fire, do not charge, do not insert incorrectly, keep out of reach of children, do not short circuit, do not mix types, do not mix old and new batteries.
7. Communication to consumers: Upon request of a consumer, above information 1. To 6. Has to be provided per article 33(2) of REACH regulation within 45 calendar days of the request and free of charge.

EGDME was not placed on the Authorization list but is listed on the Candidate List for Authorization.

Additions to Annex XIV

New substances may be added to the Annex XIV. Authorities in any one of the member states may identify substances for addition to the Annex XIV. This list of proposed substances is prioritized to determine which ones will be subject to authorization by the authorities. Once interested parties provide comment, the ECHA determines if the substance is added to the candidate list of Substances of Very High Concern for inclusion into Annex XIV. If the substance is added to the list, then companies who want to continue to manufacture or import the substance must apply for an authorization to continue to use the substance.

Covered Items under REACH

The REACH regulation applies to substance, containers, and Articles intended for sale in Europe. The REACH regulation defines Articles as “an object which during production is given a special shape, surface, or design, which determines its function to a greater degree than its chemical composition.”

Energizer batteries, lights, and chargers sold in Europe are classified as Articles per latest available Draft Final Technical Guidance document on requirements for substances in articles from Reach Implementation Project (so-called RIP 3.8) published in December 2007.

Additionally, the REACH regulation applies to substances that are intended to be released from an article. Substances may be intended to be released from articles in order to provide an “added value”, where this accessory function is not directly linked to the main function. For example a fragrance may be released from an article to provide added value, fragrance, to the product.

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Energizer batteries, lights, and chargers sold in Europe are not intended to release any substance under normal or reasonably foreseeable conditions of use (ECHA guidance document on requirements for substances in Articles, May 2008, p 73, table 5).

Conclusion

Currently, Energizer batteries, lights, and chargers do not contain any of the substances listed in the Substances of Very High Concern list more than 0.1% by weight per the latest regulation. Energizer continues to monitor any substances that are included in the priority list for inclusion into Annex XIV.

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A. Candidate List Table, last updated January 12, 2017

http://echa.europa.eu/candidate-list-table

B. Lists of SVHC to be prioritized for inclusion into Annex XIV:

B1. ECHA's 1st Recommendation for inclusion in Annex XIV (Authorization) – June 1 2009:

Substance name	EC number	CAS number
4,4'-Diaminodiphenylmethane (MDA)	202-974-4	101-77-9
5-tert-butyl-2,4,6-trinitro-m-xylene (Musk xylene)	201-329-4	81-15-2
Alkanes, C10-13, chloro (Short Chain Chlorinated Paraffins - SCCPs)	287-476-5	85535-84-8
Benzyl butyl phthalate (BBP)	201-622-7	85-68-7
Bis(2-ethylhexyl) phthalate (DEHP)	204-211-0	117-81-7
Dibutyl phthalate (DBP)	201-557-4	84-74-2
Hexabromocyclododecane HBCDD), and all major diastereoisomers identified, i.e.: alpha-, beta- and gamma- hexabromocyclododecane	247-148-4 and 221-695-9	25637-99-4 3194-55-6 (134237-50-6) (134237-51-7) (134237-52-8)

B.2. ECHA's 2nd Recommendation for inclusion in Annex XIV (Authorization) – Dec. 17, 2010:

Substance name	EC number	CAS number
2,4-dinitrotoluene (2,4-DNT)	204-450-0	121-14-2
Diarsenic pentaoxide	215-116-9	1303-28-2
Diarsenic trioxide	215-481-4	1327-53-3
Diisobutylphthalate (DIBP)	201-553-2	84-69-5
Lead chromate	231-846-0	7758-97-6
Lead chromate molybdate sulphate red - C.I. Pigment Red 104	235-759-9	12656-85-8
Lead sulfochromate yellow - C.I. Pigment Yellow 34	215-693-7	1344-37-2
Tris(2-chloroethyl)phosphate (TCEP)	204-118-5	115-96-8

B.3. ECHA's 3rd Recommendation for inclusion in Annex XIV (Authorization) – Dec. 20, 2011:

Substance name	EC number	CAS number

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Ammonium dichromate	232-143-1	7789-09-5
Acids generated from chromium trioxide and their oligomers. Names of the acids and their oligomers: Chromic acid, Dichromic acid, Oligomers of chromic acid and dichromic acid.	231-801-5; 236-881-5	7738-94-5; 13530-68-2
Chromium trioxide	215-607-8	1333-82-0
Cobalt dichloride	231-589-4	7646-79-9
Cobalt(II) carbonate	208-169-4	513-79-1
Cobalt(II) diacetate	200-755-8	71-48-7
Cobalt(II) dinitrate	233-402-1	10141-05-6
Cobalt(II) sulphate	233-334-2	10124-43-3
Potassium chromate	232-140-5	7789-00-6
Potassium dichromate	231-906-6	7778-50-9
Sodium chromate	231-889-5	7775-11-3
Sodium dichromate	234-190-3	7789-12-0; 10588-01-9
Trichloroethylene	201-167-4	79-01-6

B.4. ECHA's 4th Recommendation for inclusion in Annex XIV (Authorization) – June 20, 2012:

Substance name	**EC number**	**CAS number**
Pentazinc chromate octahydroxide	256-418-0	49663-84-5
Arsenic acid	231-901-9	7778-39-4
Formaldehyde, oligomeric reaction products with aniline (technical MDA)	500-036-1	25214-70-4
Potassium hydroxyoctaoxodizincatedichromate	234-329-8	11103-86-9
Strontium chromate	232-142-6	7789-06-2
1,2-Dichloroethane (EDC)	203-458-1	107-06-2
Dichromium tris(chromate)	246-356-2	24613-89-6
2,2'-dichloro-4,4'-methylenedianiline (MOCA)	202-918-9	101-14-4
N,N-Dimethylacetamide (DMAC)	204-826-4	127-19-5
Bis(2-methoxyethyl) ether (Diglyme)	203-924-4	111-96-6

B.5 ECHA's 5th Recommendation for inclusion in Annex XIV (Authorization) – June 23, 2013:

Substance name	**EC number**	**CAS number**
Bis(pentabromophenyl) ether (decabromodiphenyl ether)	214-604-9	1163-19-5

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(DecaBDE)		
Zirconia Aluminosilicate Refractory Ceramic Fibres (Zr-RCF) are fibres covered by index number 650-017-00-8 in Annex VI, part 3, table 3.1 of Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, and fulfil the three following conditions: a) oxides of aluminium, silicon and zirconium are the main components present (in the fibres) within variable concentration ranges b) fibres have a length weighted geometric mean diameter less two standard geometric errors of 6 or less micrometres (µm). c) alkaline oxide and alkali earth oxide (Na2O+K2O+CaO+MgO+BaO) content less or equal to 18% by weight		
Aluminosilicate Refractory Ceramic Fibres (Al-RCF) are fibres covered by index number 650-017-00-8 in Annex VI, part 3, table 3.1 of Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, and fulfil the three following conditions: a) oxides of aluminium and silicon are the main components present (in the fibres) within variable concentration ranges b) fibres have a length weighted geometric mean diameter less two standard geometric errors of 6 or less micrometres (µm) c) alkaline oxide and alkali earth oxide (Na2O+K2O+CaO+MgO+BaO) content less or equal to 18% by weight		
Diazene-1,2-dicarboxamide (C,C`-azodi(formamide)) (ADCA)	204-650-8	123-77-3
4-(1,1,3,3-tetramethylbutyl)phenol, ethoxylated (4-tert-OPnEO) [covering well-defined substances and UVCB substances, polymers and homologues]		
N,N-dimethylformamide (DMF)	200-679-5	68-12-2

C. Authorization list (Annex XIV)

http://echa.europa.eu/web/guest/addressing-chemicals-of-concern/authorisation/recommendation-for-inclusion-in-the-authorisation-list/authorisation-list

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Batteries and the European Union WEEE and RoHS Directives

Due to numerous requests for compliance certification of batteries for the recently passed WEEE and RoHS Directives in the European Union, the information below will address why batteries are not subject to the WEEE or RoHS Directives.

The WEEE Directive

Batteries are not covered by the WEEE Directive because according the WEEE Directive (art. 6.1 Treatment and its annex II) "batteries should be removed from any separately collected WEEE." When removed the batteries are then covered by the specific Directive 2006/66/EC.

RoHS

Batteries are also excluded from the 2011/65/EC RoHS Directive, as per recital 14 of the RoHS language listed below.

14) This Directive should apply without prejudice to Union legislation on safety and health requirements and specific Union waste management legislation, in particular Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and Regulation (EC) No 850/2004.