



Section 1. Product and Company Identification.

1.1 Model Number; E/START1100 v1
1.2 Description; ElectroStart® Batteryless Power Start 1100A 12V
Capacitor: 14 Volts. 100 Farads. 440 grams.

1.3 Manufacturer;

Sealey Group.
Kempson Way,
Bury St. Edmunds,
Suffolk.
IP32 7AR

1.4 Emergency telephone number; 44 (0) 1284 757 500 (Office Hours)

Date of source compilation; 05 August 2015

Section 2. Hazards Identification.

Capacitor is hermetically sealed and does not present a hazard under normal conditions of use. Inappropriate handling and / or use can cause electrolyte to leak.

Ingestion: Contents of an open battery can be harmful if swallowed.

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 irritation.



Section 3. Substances.

3.1 Chemical Name (substance)	3.1 CAS No.	3.2 Concentration Weight	Classification	
			Hazard Class & Category Code	Hazard Statements ¹
Aluminium	7429-90-5	30 -45%	Water-react. 2 Pyr. Sol. 1	H261 H250
Acetonitrile	75-05-8	25 - 30%	Flam. Liq. 2 Acute Tox. 4 Acute Tox. 4 Eye Irrit. 2 Acute Tox. 4 STOT SE 3	H225 H302 H312 H319 H332 H335
Carbon, activated	7440-44-0	15 - 25%	Flam. Sol. 2 Eye Irrit. 2 STOT SE 3 Carc. 2	H228 H319 H335 H351
Tetraethyl ammonium tetra fluoroborate	429-06-1	< 15%	Acute Tox. 4 Acute Tox. 4 Skin Irrit. 2 Eye Irrit. 2 Acute Tox. 4 STOT SE 3 Aquatic Chronic 1	H302 H312 H315 H319 H332 H335 H410
Cellulose	9004-34-6	< 5%	Acute Tox. 4 Acute Tox. 4 Skin Irrit. 2 Eye Irrit. 2 Acute Tox. 4	H302 H312 H315 H319 H332

For full text of Phrases and Statements, see Section 16.



Section 4. First Aid Measures.

4.1 Description of first aid measures

Inhalation

Remove from contaminated area.

If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.

Get immediate medical advice/attention.

Skin Contact

Immediately remove all contaminated clothing, including footwear.

Flush skin and hair with running water (and soap if available).

Seek medical attention in event of irritation.

Eye Contact

DO NOT attempt to remove particles attached to or embedded in eyes.

If in eyes, hold eyelids apart and flush the eye continuously with running water.

Get immediate medical advice/attention.

Continue flushing until advised to stop by the poisons Information Centre or a doctor, or for at least 15 minutes.

Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

Remove contact lenses, if present and easy to do. Continue rinsing.

4.2. Most important symptoms and effects, both acute and delayed

No information available.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

Section 5. Fire Fighting Measures.

5.1. Extinguishing media

DO NOT USE WATER, CO₂ or FOAM.

DO NOT use halogenated fire extinguishing agents.

Use DRY sand, graphite powder, dry sodium chloride based extinguishers, G-1 or Met L-X to smother fire.

Confining or smothering material is preferable to applying water as chemical reaction may produce flammable and explosive hydrogen gas.

Chemical reaction with CO₂ may produce flammable and explosive methane.

If impossible to extinguish, withdraw, protect surroundings and allow to burn itself out.

5.2. Special hazards arising from the substance or mixture

Reacts with acids producing flammable/explosive hydrogen (H₂) gas.

**Section 5. Fire Fighting Measures, continued.****5.3. Advice for fire-fighters**

Alert Fire Brigade and tell them location and nature of hazard

Wear breathing apparatus plus protective gloves.

Prevent, by any means available, spillage from entering drains or water courses.

Use water delivered as a fine spray to control fire and cool adjacent area.

DO NOT approach containers believed to be hot.

Cool fire exposed containers with water spray from a protected location.

If safe to do so, remove containers from path of fire.

Equipment should be thoroughly decontaminated after use.

Warning: In use may form flammable/explosive vapour – air mixes.

DO NOT disturb burning dust. Explosion may result if dust is stirred into a cloud, by providing oxygen to large surface of hot metal.

With the exception of the metals that burn in contact with air or water (e.g. sodium), masses of combustible metals do not represent unusual fire risks because they have the ability to conduct heat away from hot spots so efficiently that the heat of combustion cannot be maintained; this means that it will require a lot of heat to ignite a mass of combustible metal. Generally, metal fire risks exist when sawdust, machine shavings or other metal 'fines' are present. Metal powders while generally regarded as non-combustible:

- May burn when metal if finely divided and energy input is high.

- May react violently with water.

- May be ignited by friction, heat, sparks or flame.

- May **REIGNITE** after fire is extinguished.

- Will burn with intense heat.

Note:

Metal dust fires are slow moving but intense and difficult to extinguish.

Containers may explode on heating.

Dust or fumes may form explosive mixtures with air.

Gases generated in fire may be poisonous, corrosive or irritating.

Hot or burning metals may react violently upon contact with other material, such as oxidising agents and extinguishing agents used on fires involving ordinary combustibles or flammable liquids.

Temperatures produced by burning metals can be higher than temperatures generated by burning flammable liquids.

Some metals can continue to burn in carbon dioxide, nitrogen, water or steam atmospheres in which ordinary combustibles or flammable liquid would be incapable of burning.

Combustion products include: carbon monoxide (CO), carbon dioxide (CO₂), nitrogen oxides (NO_x), hydrogen fluoride, other pyrolysis products typical of burning organic material. When aluminium oxide dusts dispersed in air, firefighters should wear protection against inhalation of dust particles, which can also contain hazardous substances from the fire absorbed on the alumina particles.

Particle size, coating and dispersion in air determine reactivity of aluminium.

Bulk aluminium is not combustible but at high temperatures, molten aluminium can be ignited and burn.

Molten aluminium may react violently if it comes into contact with water, aluminium is rapidly oxidised by water at 180°C.

Atomised aluminium dusts are potentially explosive. Electric sparks may ignite the dust cloud even in atmospheres containing low oxygen (7%).

In air the dust may be ignited in contact with hot surfaces or flame where temperatures exceed 640°C



Section 6. Accidental Release Measures.

Remove all ignition sources.
 Clean up all spills immediately.
 Avoid contact with skin and eyes.
 Control personal contact with the substance, by using protective equipment.
 Use dry clean up procedures and avoid generating dust.
 Place in a suitable, labelled container for waste disposal.
 Environmental hazard-contain spillage.
 Wash area down with large amounts of water and prevent runoff into drains.

6.1. Personal precautions, protective equipment and emergency procedures

6.2. Environmental precautions

6.3. Methods and material for containment and cleaning up

6.4. Reference to other sections

See Section 7 for information on Safe Handling

See Section 8 for information of Personal Protective Equipment.

See Section 13 for information on disposal.

Section 7. Handling and Storage.

7.1. Precautions for safe handling

Store in original containers

Keep containers securely sealed Store in a cool, dry area protected from environment extremes.

Store away from incompatible materials and foodstuff containers.

Protect containers against physical damage and check regularly for leaks.

Observe manufacturer's storage and handling recommendations contained within this MSDS.

For major quantities:

Consider storage in bunded areas – ensure storage areas are isolated from sources of community water (including: storm water, groundwater, lakes and streams).

7.2. Conditions for safe storage, including any incompatibilities

For Alumina's (aluminium oxide):

Incompatible with hot chlorinated rubber.

In the presence of chlorine trifluoride may react violently and ignite.

May initiate explosive polymerisation of olefin oxides including ethylene oxide.

Produces exothermic reaction above 200°C with halocarbons and an exothermic reaction at ambient temperatures with halocarbons in the presence of other metals.

Produces exothermic reaction with oxygen difluoride.

Forms explosive mixtures with sodium nitrate.

Salts of inorganic fluoride

Reacts with water forming acidic solutions.

Is violently reactive with boron, bromine pentafluoride, bromine trifluoride, calcium disilicide, Calcium hydride, oxygen difluoride, platinum, potassium.

In aqueous solutions are incompatible with sulphuric acid, alkalis, ammonia, aliphatic amines, Alkanolamines, alkylene oxides, amides, epichlorohydrin, isocyanates, nitromethane, organic anhydrides, vinyl acetate.



Section 7. Handling and Storage, continued.

Acetonitrile:

Forms cyanide gas on contact with steam.

Reacts violently with oxidisers such as chlorine, bromine, fluorine: with chlorosulphonic acid, oleum and sulphuric acid.

Is incompatible with water (especially if acid or alkaline), acids, caustics, nitrating agents, indium, nitrogen tetroxide, sulphur trioxide, iron (III) salts of perchlorate, nitrogen fluoride compounds.

Attacks most rubbers and plastics.

May accumulate electrical charge, causing ignition of vapours.

Contact with acids produces toxic fumes.

Nitriles may polymerise in the presence of metals and some metal compounds.

They are incompatible with acids; mixing nitriles with strong oxidising can lead to extremely violent reactions.

Nitriles are generally incompatible with other oxidising agents such as peroxides and epoxides.

The combination of bases and nitriles can produce hydrogen cyanide, Nitriles are hydrolysed exothermally in both aqueous acid and base to give carboxylic acid (or salts of carboxylic acids).

Nitriles can react vigorously with reducing agents.

The covalent cyano group is endothermic and many organic nitriles are reactive under certain condition;

N-cyano derivatives are reactive or unstable.

The majority of endothermic compounds are thermodynamically unstable and may decompose explosively under various circumstances of initiation.

Many but not all endothermic compounds have been involved in decompositions, reactions and explosions and, general, compounds with significantly positive values of standard heat of formation, may be considered suspect on stability grounds.

7.3. Specific end use(s)

Intended for use as batteryless power start: Model Number identified in 1.1 with Description stated in 1.2.

Section 8. Exposure Controls/Personal Protection.

8.1. Control parameters

Occupational Exposure Limits-UK Workplace Exposure Limits (WELs)

Material	TWA	STEL	Peak	Notes
Aluminium Metal Inhalable Dust	10mg/m ³	Not Available	Not Available	Not Available
Aluminium Metal Respirable Dust	4mg/m ³	Not Available	Not Available	Not Available
Acetonitrile	68mg/m ³ - 40ppm	102 mg/m ³ - 60ppm	Not Available	Not Available
Graphite Inhalable Dust	10mg/m ³	Not Available	Not Available	Not Available
Graphite Respirable	4mg/m ³	Not Available	Not Available	Not Available
Cellulose Inhalable Dust	10mg/m ³	Not Available	Not Available	Not Available
Cellulose Respirable	4mg/m ³	20mg/m ³	Not Available	Not Available



Section 8. Exposure Controls/Personal Protection, continued.

8.2. Exposure controls

Eye/Face Protection

Safety glasses with side shields

Chemical goggles

Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. Medical and first aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lenses as soon as practicable. Lens should be removed at the first signs of eye redness or irritation – lens should be removed in a clean environment only after workers have washed hands thoroughly.

Skin Protection

Wear protective gloves, overalls, PVC apron, barrier cream, skin cleansing cream and eye wash unit if the battery is leaking.

Respiratory Protection No information available.

Section 9. Physical and Chemical Properties.

9.1. Information on basic physical and chemical properties

The following information is not a technical specification or sales specification.

- | | |
|---|---------------------------|
| (a) Appearance: | Silver solid. |
| (b) Odour: | No information available. |
| (c) Odour threshold; | No information available. |
| (d) pH: | No information available. |
| (e) Melting point/freezing point; | No information available. |
| (f) Initial boiling point and boiling range; | No information available. |
| (g) Flash point; | No information available. |
| (h) Evaporation rate; | No information available. |
| (i) Flammability (solid, gas); | Not flammable. |
| (j) Upper/lower flammability or explosive limits; | No information available. |
| (k) Vapour pressure; | No information available. |
| (l) Vapour density; | No information available. |
| (m) Relative density; | No information available. |
| (n) Solubility(ies); | No information available. |
| (o) Partition coefficient: n-octanol/water; | No information available. |
| (p) Auto-ignition temperature; | No information available. |
| (q) Decomposition temperature; | No information available. |
| (r) Viscosity; | No information available. |
| (s) Explosive properties; | No information available. |
| (t) Oxidising properties. | No information available. |

9.2 Other information No information available.



Section 10. Stability and Reactivity.

10.1. Reactivity See section 7.2

10.2. Chemical stability Unstable in the presence of incompatible materials. Product is considered stable. Hazardous polymerisation will not occur.

10.3. Possibility of hazardous reactions See section 7.2

10.4. Conditions to avoid See section 7.2

10.5. Incompatible materials See section 7.2

10.6. Hazardous decomposition products See section 5.3

Section 11. Toxicological Information.

11.1. Information on toxicological effects

Inhalation

The inhalation of dusts, generated by the material during the course of normal handling, may be harmful.

The material can cause respiratory irritation in some persons. The body's response to such irritation can cause further lung damage.

The inhalation of small particles of metal oxide results in sudden thirst, a sweet metallic foul taste, throat irritation, cough, dry mucous membranes, tiredness and general un-wellness. Headache, nausea and vomiting, fever or chills, restlessness, sweating, diarrhoea, excessive urination and prostration may also occur.

The smell of acetonitrile does not give enough warning of exposure. The gas is highly toxic, and inhaling it can cause loss of consciousness.

Ingestion.

Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150g may be fatal or may produce serious damage to the health of the individual.

Nitrile poisoning exhibits similar symptoms to poisoning due to hydrogen cyanide. The substances irritate the eyes and skin and are absorbed quickly and completely through the skin.

Acute toxic responses to aluminium are confined to the more soluble forms.

Borate poisoning causes nausea, vomiting, diarrhoea and pain in the upper abdomen. Often persistent vomiting occurs, and there may be blood in the faeces.

Concentrated solutions of many cationics may cause corrosive damage to mucous membranes and the oesophagus. Nausea and vomiting (sometimes bloody) may follow ingestion.

Cyanide poisoning can cause increased saliva output, nausea without vomiting, anxiety, confusion, dizziness, stiffness of the lower jaw, convulsions, spasm, paralysis, coma and irregular heartbeat and stimulation of breathing followed by failure. Often the skin becomes cyanosed (blue grey) and this often delayed.



Section 11. Toxicological Information, continued.

Skin contact.

Skin contact with the material may be harmful; systemic effects may result following absorption. This material can cause inflammation of the skin on contact in some persons. The material may accentuate any pre-existing dermatitis condition. Though considered non-harmful, slight irritation may result from contact because of the abrasive nature of the aluminium oxide particle. Thus it may cause itching and skin reaction and inflammation. Cationic surfacants cause skin irritation and, in high concentrations, caustic burns. Open cuts, abraded or irritated should not be exposed to this material. Entry into the blood stream through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

Eye contact.

Many cationic surfacants are very irritating to the eyes at low concentration. Concentrated solutions can cause severe burns with permanent clouding. There is evidence that material may produce eye irritation in some persons and produce eye damage 24hours or more after instillation. Severe inflammation may be expected with pain.

Chronic

Long –term exposure to respiratory irritants may result in disease of the airways involving difficult breathing and related systemic problems. Substance accumulation, in the human body, may occur and may cause some concern following repeated or long term occupational exposure. Animal testing shows long term exposure to aluminium oxides may cause lung disease and cancer, depending on the size of the particle. The smaller the size, the greater the tendency to cause harm. Exposure to large doses of aluminium has been connected with the generative brain disease Alzheimer’s disease. Chronic exposure to cyanides and certain nitriles may result in interference to iodine uptake by thyroid gland and its subsequent enlargement. This occurs following metabolic conversion of the cynide moierty to thiocyanate. Prolonged or repeated skin contact may cause degreasing with drying, cracking and dermatitis following. Borate can accumulate in the testes and deplete germ cells and cause withering of the testicles, according to animal testing. Hair loss, skin inflammation, stomach ulcer, and anaemia can all occur.

Toxicity

Material	Toxicity	Irritation
Acetonitrile	Dermal (rabbit) LD50: 400mg/kg	Eye (rabbit) 23mg (open)-SEVERE
	Inhalation (rat) LC50: 17100ppmh/4H	Skin (rabbit) 500mg (open)-mild
	Oral (rat) LD50: 13444.49 mg/kg	



Section 12. Ecological Information.

12.1. Toxicity

12.2. Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
Acetonitrile	HIGH (Half-life=360Days)	HIGH (half –life 541.29)
Cellulose	Low	Low

12.3. Bioaccumulative potential

Ingredient	Bioaccumulation
Acetonitrile	LOW (BCF=4)
Cellulose	LOW (LogKOW=5.1249)

12.4. Mobility in soil

Ingredient	Mobility
Acetonitrile	LOW (KOC=4.5)
Cellulose	LOW ((KOC=10)

12.5. Results of PBT and vPvB assessment

Not available.

12.6. Other adverse effects

Not available.

Section 13. Disposal Considerations.

13.1. Waste treatment methods

Dispose of product in accordance with national and local regulations.



Section 14. Transport Information.

ADR. International Carriage of Dangerous Goods by Road.

14.1. UN number	UN 3499
14.2. Name and Description	Capacitor, electric double layer
14.3. Transport hazard class(es)	Class 9
14.4. Packing group	-
14.5. Environmental hazards	Does not present an environmental hazard.
14.6. Special precautions for user	No special precautions necessary.

IATA. International Air Transport Association.

14.1. UN number	UN 3499
14.2. UN Proper Shipping Name/Description	Capacitor, electric double layer
14.4. Packing group	-

Special Provision A186

This entry applies to electric double layer capacitors with an energy storage capacity greater than 0.3 Wh.

Capacitors with an energy storage capacity of 0.3 Wh or less are not subject to these Regulations.

Energy storage capacity means the energy held by a capacitor, as calculated using the nominal voltage and capacitance. All capacitors to which this entry applies, including capacitors containing an electrolyte that does not meet the classification criteria of any class or division of dangerous goods, must meet the following conditions:

- (a) capacitors not installed in equipment must be transported in an uncharged state. Capacitors installed in equipment must be transported either in an uncharged state or protected against short circuit;
- (b) each capacitor must be protected against a potential short circuit hazard in transport as follows:
 1. when a capacitor's energy storage capacity is less than or equal to 10 Wh or when the energy storage capacity of each capacitor in a module is less than or equal to 10 Wh, the capacitor or module must be protected against short circuit or be fitted with a metal strap connecting the terminals; and
 2. when the energy storage capacity of a capacitor or a capacitor in a module is more than 10 Wh, the capacitor or module must be fitted with a metal strap connecting the terminals.
- (c) capacitors containing dangerous goods must be designed to withstand a 95 kPa pressure differential;
- (d) capacitors must be designed and constructed to safely relieve pressure that may build up in use, through a vent or a weak point in the capacitor casing. Any liquid which is released upon venting must be contained by packaging or by equipment in which a capacitor is installed; and
- (e) capacitors manufactured after 31 December 2013 must be marked with the energy storage capacity in Wh.

Capacitors containing an electrolyte not meeting the classification criteria of any class or division of dangerous goods, including when installed in equipment, are not subject to other provisions of these Regulations.

Capacitors containing an electrolyte meeting the classification criteria of any class or division of dangerous goods, with an energy storage capacity of 10 Wh or less are not subject to other provisions of these Regulations when they are capable of withstanding a 1.2 m drop test unpackaged on an unyielding surface without loss of contents.

Capacitors containing an electrolyte meeting the classification criteria of any class or division of dangerous goods that are not installed in equipment and with an energy storage capacity of more than 10 Wh are subject to these Regulations.



Section 14. Transport Information, continued.

Capacitors installed in equipment and containing an electrolyte meeting the classification criteria of any class or division of dangerous goods are not subject to other provisions of these Regulations provided the equipment is packaged in a strong outer packaging constructed of suitable material and of adequate strength and design in relation to the packaging's intended use and in such a manner as to prevent accidental functioning of capacitors during transport. Large robust equipment containing capacitors may be offered for transport unpackaged or on pallets when capacitors are afforded equivalent protection by the equipment in which they are contained.

- 14.5. Environmental hazards** Does not present an environmental hazard.
- 14.6. Special precautions for user** No special precautions necessary.

IMDG. International Maritime Dangerous Goods.

- 14.1. UN number** UN 3499
- 14.2. UN proper shipping name** Capacitor, electric double layer
- 14.3. Transport hazard class(es)** Class 9
- 14.4. Packing group** -
- 14.5. Environmental hazards** Does not present an environmental hazard.
- 14.6. Special precautions for user** No special precautions necessary.
- 14.7. Transport in bulk – Maritime only.** Bulk transport is not applicable to this product



Section 15. Regulatory Information.

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
No information available.

15.2. Chemical safety assessment
No information available.

Section 16. Additional Information.

Full text of Phrases and Statements used in Section 3;

H225: Highly flammable liquid and vapour.
 H228: Flammable solid.
 H250: Catches fire spontaneously if exposed to air.
 H261: In contact with water releases flammable gases.
 H302: Harmful if swallowed.
 H312: Harmful in contact with skin.
 H315: Causes skin irritation.
 H319: Causes serious eye irritation.
 H332: Harmful if inhaled.
 H335: May cause respiratory irritation.
 H351: Suspected of causing cancer.
 H410: Very toxic to aquatic life with long lasting effects.

The above information is believed to be accurate and represents the best information currently available.

No warranty is expressed or implied by the above information.

We assume no liability resulting from use of the above information.

The end user should conduct their own investigations to determine the suitability of the above information for their particular purpose.

Issue level	Date	Revisions
1	26/10/16	First issue.
2	12/12/16	Section 2 & 14
3	15/08/19	Section 14

End of Safety Data Sheet.