SAFETY DATA SHEET

SECTION 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MANUFACTURER'S NAME: Tacwise Group Plc

PRODUCT NAME: Cylindrical Lithium-Ion Cell
USED IN PRODUCTS: 1558, 1559, 1563, 1564
RATING: Nominal Voltage: 3.7V
Rated Capacity: 1300mAh, 4.81Wh
Weight: 41g

SECTION 2. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Preparation		
Chemical Name	**Percent of Content**	**CAS No.**
Lithium nickel cobalt manganese oxide	25%~30%	182442-95-1
Polyvinylidene fluoride ($(CH_2CF_2)n$)	0.5%~2%	24937-79-9
Graphite powder (C)	15%~20%	7782-42-5
Lithium hexafluorophosphate ($LiPF_6$)	0.5%~3%	21324-40-3
Ethylene carbonate ($C_3H_5O_4$)		96-49-1
Dimethyl carbonate ($C_3H_6O_3$)		616-38-6
Methyl ethyl carbonate ($C_4H_8O_3$)		623-53-0
Diethyl carbonate ($C_5H_{10}O_3$)		105-58-8
Polypropylene ($(C_3H_6)n$)	1%~2%	9003-07-0
Copper foil (Cu)	5%~10%	7440-50-8
Nickel (Ni)	0.7%~1%	7440-02-0
Aluminium foil (Al)	5%~10%	7429-90-5

SECTION 3. HAZARDS SUMMARIZING

DANGER SORT: N/A

ROUTES OF ENTRY:

1. Eyes and Skin – When leaking, the electrolyte solution contained in the battery irritates to ocular tissues and the skin.
2. Inhalation – Respiratory (and eye) irritation may occur if fumes are released due to heat or an abundance of leaking batteries.
3. Ingestion – The ingestion of the battery can be harmful. Content of open battery can cause serious chemical burns of mouth, oesophagus and gastrointestinal tract.

HEALTH HARM: Exposure to leaking electrolyte from ruptured or leaking battery can cause:

1. Inhalation – Burns and irritation of the respiratory system, coughing, wheezing, and shortness of breath.
2. Eyes – Redness, tearing, burns. The electrolyte is corrosive to all ocular tissues.
3. Skin – The electrolyte is corrosive and causes skin irritation and burns.

4. Ingestion – The electrolyte solution causes tissue damage to throat and gastrointestinal tract.

ENVIRONMENTAL HARM: Not necessary under conditions of normal use.

EXPLOSION DANGER: The battery may be explosive at high temperature (above 150°C) or exposing to fire.

SECTION 4. FIRST AID MEASURES

SKIN CONTACT: Not anticipated. If the battery is leaking and the contained material contacts the skin, flush with copious amounts of clear water for at least 15 minutes.

EYE CONTACT: Not anticipated. If the battery is leaking and the contained material contacts eyes, flush with copious amounts of clear water for at least 15 minutes. Get medical attention at once.

INHALATION: Not anticipated. If the battery is leaking, move to get fresh air. If irritation persists, consult a physician.

INGESTION: Not anticipated. If the battery is leaking and the contained material is ingested, rinse mouth and surrounding area with clear water at once. Consult a physician immediately for treatment.

SECTION 5. FIRE FIGHTING MEASURES

UNUSUAL FIRE AND EXPLOSION HAZARDS: Battery may explode or leak potentially hazardous vapours subject to: exposed to excessive heat (above the maximum rated temperature as specified by the manufacturer) or fire, over-charged, short circuit, punctured and crushed.

HAZARDOUS COMBUSTION PRODUCTS: Fire, excessive heat, or over voltage conditions may produce hazardous decomposition products. Damaged batteries can result in rapid heating and the release of flammable vapours.

EXTINGUISHING MEDIA: Dry chemical type extinguishers are the most effective means to extinguish a battery fire. A CO_2 extinguisher will also work effectively.

FIRE FIGHTING PROCEDURES: Use a positive pressure self-contained breathing apparatus if batteries are involved in a fire. Full protective clothing is necessary. During water application, caution is advised as burning pieces of flammable particles may be ejected from the fire.

SECTION 6. ACCIDENTAL RELEASE MEASURES

The material contained within the battery would only be released under abusive conditions. In the event of battery rupture and leakage, collect all the released materials that are not hot or burning in an appropriate waste disposal container while wearing proper protective clothing and ventilate the area. Place in approved container and dispose according to the local regulations

SECTION 7. HANDLING AND STORAGE

HANDING:

1. Batteries are designed to be recharged. However, improperly charging a battery may cause the battery to flame. When charging the battery, use dedicated chargers and follow the specified conditions.

	2. Never disassemble or modify a battery. 3. Do not immerse, throw, and wet a battery in water.
HANDING (Cont.):	4. Should a battery unintentionally be crushed, thus releasing its contents, rubber gloves must be used to handle all battery components. Avoid the inhalation of any vapours that may be emitted. 5. Short circuit causes heating. In addition, short circuit reduces the life of the battery and can lead to ignition of surrounding materials. Physical contact with to short-circuited battery can cause skin burn. 6. Avoid reversing the battery polarity, which can cause the battery to be damaged or flame. 7. In the event of skin or eye exposure to the electrolyte, refer to First Aid Measures.
STORAGE:	1. Batteries should be separated from other materials and stored in a non-combustible, well ventilated, sprinkler-protected structure with sufficient clearance between walls and battery stacks. Do not place batteries near heating equipment, nor expose to direct sunlight for long periods. 2. Keep batteries in original packaging until use and do not jumble them.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:	Keep away from heat and open flame.
VENTILATION:	Not necessary under conditions of normal use. In case of abuse, use adequate mechanical ventilation (local exhaust) for the battery that vent gas or fumes.
RESPIRATORY PROTECTION:	Not necessary under conditions of normal use. If battery is burning, leave the area immediately. During firefighting, firemen should use self-contained breathing, full-face respiratory equipment. Fires may be fought but only from safe fire fighting distance, evacuate all persons from the area of fire immediately.
EYE PROTECTION:	Not necessary under conditions of normal use. Use safety glasses with side shields if handling a leaking or ruptured battery.
BODY PROTECTION:	Not necessary under conditions of normal use. Use rubber apron and protective working in case of handling a leaking or ruptured battery.
PROTECTIVE GLOVES:	Not necessary under conditions of normal use. Use chemical resistant rubber gloves if handling a leaking or ruptured battery.
OTHERS:	Use good chemical hygiene practice. Wash hands thoroughly after clearing-up a battery spill caused by leaking battery. No eating, drinking, or smoking in battery storage area.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

STATE:	Solid
ODOUR:	N/A
pH:	N/A

VAPOUR PRESSURE:	N/A
VAPOUR DENSITY:	N/A
BOILING POINT:	N/A
SOLUBILITY IN WATER:	Insoluble
SPECIFIC GRAVITY:	N/A
DENSITY:	N/A

SECTION 10. STABILITY AND REACTIVITY

STABILITY:	Stable
CONDITIONS TO AVOID:	Do not heat, throw into fire, disassemble, short circuit, immerse in water or overcharge, etc.
INCOMPATIBILITY:	None during normal operation. Avoid exposure heat, open flame and corrosives.
HAZARDOUS POLYMERIZATION:	Will not occur.
HAZARDOUS DECOMPOSITION PRODUCTS:	The battery may release irritative gas once the electrolyte leakage.

SECTION 11. TOXICOLOGICAL INFORMATION

The battery does not elicit toxicological properties during routine handling and use. If the battery is opened through misuse or damage, discard immediately. Internal components of cell are irritant and sensitization.

IRRITANCY:	The electrolytes contained in this battery can irritate eyes with any contact. Prolonged contact with the skin or mucous membranes may cause irritation.
SENSITIZATION:	No information is available.
TERATOGENICITY:	No information is available.
CARCINOGENICITY:	No information is available.
MUTAGENICITY:	No information is available.
REPRODUCTIVE TOXICITY:	No information is available.

SECTION 12. ECOLOGICAL INFORMATION

1. When properly used and disposed, the battery does not present environmental hazard.
2. The battery does not contain mercury, cadmium, or lead.
3. Do not let internal components enter marine environment. Avoid releasing to water ways, wastewater or ground water.

SECTION 13. DISPOSAL CONSIDERATIONS

1. Disposal of the battery should be performed by permitted, professional disposal firms knowledgeable in Federal, State or Local requirements of hazardous waste treatment and hazardous waste transportation.
2. The battery should be completely discharged prior to disposal and/or the terminals taped or capped to prevent short circuit. When completely discharged it is not considered hazardous.
3. The battery contains recyclable materials. Recycling options available in your local area should be considered when disposing of this product, through licensed waste carrier.

SECTION 14. TRANSPORT INFORMATION

According to PACKING INSTRUCTION 965 ~ 967 of IATA DGR 59th Edition for transportation, the special provision 188 of IMDG (inc Amdt 38-16). The batteries should be securely packed and protected against short-circuits. Examine whether the package of the containers are integrate and tighten closed before transport. Take in a cargo of them without falling, dropping, and breakage. Prevent collapse of cargo piles. Don't put the goods together with oxidizer and chief food chemicals. The transport vehicle should be cleaned and sterilized before transport. During transport, the vehicle should prevent exposure, rain and high temperature. For stopovers, the vehicle should be away from fire and heat sources. When transported by sea, the assemble place should be kept away from bedroom and kitchen, and isolated from the engine room, power and fire source. Under the condition of Road Transportation, the driver should drive in accordance with regulated route, don't stop over in the residential area and congested area.

(a) UN NUMBER: 3480 & 3481

(b) UN PROPER SHIPPING NAME LITHIUM ION BATTERIES (including lithium ion polymer batteries) or; LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT or LITHIUM ION BATTERIES PACKED WITH EQUIPMENT (including lithium ion polymer batteries)

(c) TRANSPORT HAZARD CLASS(ES): 9

(d) PACKING INSTRUCTION (IF APPLICABLE): 965 II/ IB, 966 II, 967 II

(e) MARINE POLLUTANT (YES/NO): No

(f) TRANSPORT IN BULK (ACCORDING TO ANNEX II OF MARPOL 73/78 AND THE IBC CODE):

No information available.

(g) SPECIAL PRECAUTIONS: No information available.

SECTION 15. REGULATORY INFORMATION

The transport of rechargeable lithium-ion batteries regulated by the United Nations as detailed in the "model Regulations on the transport of dangerous Goods Ref. ST/SG/AC.10/1 Revision 19 2015".
Defined by the UN in the "Recommendations on the transport of Dangerous Goods Chapter 38.3 Manual of Tests and Criteria Ref. ST/SG/AC/ 10/11 sixth revised edition 2015". The Lithium-ion Cells and the battery Packs may or may not be assigned to the UN No. 3480 Class-9 that is restricted for transport.

SECTION 16. OTHER INFORMATION