

MSDS Report

MSDS 报告

Report No.: 报告编号:	2502Y16422E-SF-02	
Applicant: 申请商:	Astera LED Technology GmbH	
Address: 地址:	Schatzbogen 60, 81829 Munich, Germany	
Manufacturer: 制造商:	Astera Manufacturing Limited 猎光照明科技（深圳）有限公司	
Address: 地址	101, 201, 301, 401, 501, Bldg. 3, CLT Science & Technology Park, No. 7, GanLiliu Road, Jihua subdistrict, Longgang District, Shenzhen, Guangdong Province, P.R. China 深圳市龙岗区吉华街道甘坑社区甘李六路7号吓围工业厂区3号厂房 101、201、301、401、501	
Sample name: 样品名称:	NetBox switch AST-NETBX (Containing Rechargeable Li-ion Battery Pack AST-NETBX-BAT 3.6V 3500mAh 12.6Wh) 奥伯龙交换机 AST-NETBX(内置可充离子电池组AST-NETBX-BAT 3.6V 3500mAh 12.6Wh)	
Model: 型号:	AST-NETBX	
Testing laboratory: 测试实验室:	Bay Area Compliance Laboratories Corp.(Dongguan) 倍科质量技术服务（东莞）有限公司	
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Issued date: 发布日期:	2025-10-20	

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Section 1 – Chemical Product and Company Identification 产品及企业标识

Product Name :	NetBox switch AST-NETBX (Containing Rechargeable Li-ion Battery Pack AST-NETBX-BAT 3.6V 3500mAh 12.6Wh)
产品名称:	奥伯龙交换机 AST-NETBX (内置可充电离子电池组AST-NETBX-BAT 3.6V 3500mAh 12.6Wh)
Trade Mark..... :	N/A
Model :	AST-NETBX
Rating..... :	Nominal Voltage 标称电压:3.6V Rated Capacity 额定容量: 3500mAh/12.6Wh
Weight..... :	About 52.215g 大约 52.215 克
Dimension :	Max: T 厚度: 18.70mm, W 宽度:22.45mm, L 长度:75.20mm
Factory's Name :	Astera Manufacturing Limited 猎光照明科技（深圳）有限公司
Address :	101, 201, 301, 401, 501, Bldg. 3, CLT Science & Technology Park, No. 7, GanLiliu Road, Jihua subdistrict, Longgang District, Shenzhen, Guangdong Province, P.R. China 深圳市龙岗区吉华街道甘坑社区甘李六路 7 号吓围工业厂区 3 号厂房
E-mail address :	Nemo@astera-led.email
Contact information :	18123965006
联系方式:	

Section 2 – Hazards Identification 危害识别

Preparation hazards and classification 制剂危害及分类	Not dangerous with normal use. Do not dismantle,open or shred Li-ion Battery. Exposure to the ingredients contained within or their ingredients products could be harmful. 正常使用没有危险。请勿拆卸、打开或撕碎锂离子电池。 接触产品中所含的成分或其成分可能是有害的。
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Appearance, Color, and Odor 外观、颜色和气味	Solid object with no odor, blue. 没有气味的固体，蓝色的。
Primary Route(s) of Exposure 主要暴露途径	These chemicals are contained in a sealed stainless steel enclosure. Risk of exposure occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, exposure to the electrolyte solution contained within can occur by Inhalation, Ingestion, Eye contact and Skin contact. 这些化学品装在一个密封的不锈钢外壳中。只有当电池被机械、热或电滥用到损坏外壳的程度时，才有暴露的风险。如果发生这种情况，可能会通过吸入、摄入、眼睛接触和皮肤接触等方式暴露于电解液中。
Potential Health Effects 潜在的健康影响	ACUTE (short term): see Section 8 for exposure controls In the event that this battery has been ruptured, the electrolyte solution contained within the battery would be corrosive and can cause burns. 急性（短期）： 有关暴露控制，请参阅第 8 节。如果电池破裂，电池内的电解质溶液将具有腐蚀性，并可能导致烧伤。 Inhalation: Inhalation of materials from a sealed battery is not an expected route of exposure. Vapors or mists from a ruptured battery may cause respiratory irritation. 吸入： 从密封电池中吸入材料不是预期的暴露途径。电池破裂产生的蒸汽或烟雾可能会引起呼吸道刺激。 Ingestion: Swallowing of materials from a sealed battery is not an expected route of exposure. Swallowing the contents of an open battery can cause serious chemical burns of mouth, esophagus, and gastrointestinal tract. 摄入： 吞咽密封电池中的材料不是预期的暴露途径。吞下打开的电池中的东西会导致口腔、食道和胃肠道的严重化学灼伤。 Skin: Contact between the battery and skin will not cause any harm. Skin contact with contents of an open battery can cause severe irritation or burns to the skin. 皮肤： 电池与皮肤接触不会造成任何伤害。皮肤接触开路电池的内容物可能会对皮肤造成严重刺激或烧伤。 Eye: Contact between the battery and the eye will not cause any harm. Eye contact with contents of an open battery can cause severe irritation or burns to the eye. 眼睛： 电池与眼睛接触不会造成任何伤害。眼睛与打开的电池内容物接触会对眼睛造成严重刺激或烧伤。 CHRONIC (long term): see Section 11 for additional toxicological data 慢性（长期）： 其他毒理学数据见第 11 节
Medical Conditions Aggravated	Not applicable

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by Exposure 因暴露而加重的医疗状况	不适用
Reported as carcinogen 报告为致癌物	Not applicable 不适用

Section 3 – Composition/Information on Ingredients 产品成分信息

Hazardous Ingredients (Chemical Name) 化学名称	Concentration or concentration ranges (%) 含量百分比	CAS Number CAS 编号
Lithium Cobalt Oxide Battery 钴酸锂	15-40	12190-79-3
Graphite 石墨	10-30	7782-42-5
Phosphate(1-),heafafluoro-,lithium 六氟磷酸锂	10-30	21324-40-3
Copper 铜箔	7-13	7440-50-8
Aluminum 铝箔	5-10	7429-90-5
Nickel 镍	1-5	14332-32-2

Note: CAS number is Chemical Abstract Service Registry Number.

注: CAS 编号为化学文摘服务注册号。

Section 4 – First-aid Measures 急救措施

Inhalation 吸入	If contents of an opened battery are inhaled, remove source of contamination or move victim to fresh air. Obtain medical advice. 如果打开的电池中的内容物被吸入, 请清除污染源或将受害者转移到新鲜空气中。 获取医疗建议。
Skin contact 皮肤接触	If skin contact with contents of an open battery occurs, as quickly as possible remove contaminated clothing, shoes and leather goods. Immediately flush with lukewarm, gently flowing water for at least 30 minutes. If irritation or pain persists,

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	<p>seek medical attention. Completely decontaminate clothing, shoes and leather goods before reuse or discard.</p> <p>如果皮肤接触到开路电池的内容物, 请尽快脱掉受污染的衣服、鞋子和皮革制品。立即用微温、轻柔流动的水冲洗至少 30 分钟。如果刺激或疼痛持续, 请就医。在重复使用或丢弃之前, 彻底净化衣服、鞋子和皮革制品。</p>
Eye contact 眼睛接触	<p>If eye contact with contents of an open battery occurs, immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 30 minutes while holding the eyelids open. Neutral saline solution may be used as soon as it is available. If necessary, continue flushing during transport to emergency care facility. Take care not to rinse contaminated water into the unaffected eye or onto face. Quickly transport victim to an emergency care facility.</p> <p>如果眼睛接触到打开的电池中的内容物, 请立即用微温、轻柔流动的水冲洗受污染的眼睛至少 30 分钟, 同时保持眼睑打开。只要有可用的中性盐水溶液, 就可以使用。如有必要, 在运送至急救机构期间继续冲洗。注意不要将受污染的水冲洗到未受影响的眼睛或脸上。迅速将受害者送往急救机构。</p>
Ingestion 摄入	<p>If ingestion of contents of an open battery occurs, never give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. Have victim rinse mouth thoroughly with water. Do not induce vomiting. Have victim drink 60 to 240mL of water. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Have victim rinse mouth with water again. Quickly transport victim to an emergency care facility.</p> <p>如果摄入了打开的电池中的内容物, 如果受害者正在迅速失去意识, 或者昏迷或抽搐, 请不要用嘴给任何东西。让受害者用水彻底漱口。不要催吐。让受害者喝 60 到 240 毫升的水。如果呕吐是自然发生的, 让受害者身体前倾, 以降低误吸的风险。让受害者再次用水漱口。迅速将受害者送往急救机构。</p>

Section 5 – Fire-fighting Measures 消防措施

Flammable Properties 易燃特性	<p>In the event that this battery has been ruptured, the electrolyte solution contain within the battery would be flammable. Like any sealed container, battery cells may rupture when exposed to excessive heat; this could result in the release of flammable or corrosive materials.</p> <p>如果该蓄电池破裂, 则蓄电池内的电解质溶液将是易燃的。与任何密封容器一样, 电池单元在暴露于过热时可能会破裂; 这可能导致易燃或腐蚀性材料的释放。</p>
Suitable extinguishing Media 适用灭火剂	<p>Use extinguishing media suitable for the materials that are burning.</p> <p>使用适合燃烧材料的灭火介质。</p>

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Unsuitable extinguishing Media 不合适的灭火介质	Not available 不适用
Explosion Data 爆炸数据	<p>Sensitivity to Mechanical Impact: This may result in rupture in extreme cases 对机械冲击的敏感性：在极端情况下，这可能导致破裂</p> <p>Sensitivity to Static Discharge: Not Applicable 对静电放电的敏感性：不适用</p>
Specific Hazards arising from the chemical 化学品产生的特定危害	<p>Fires involving Li-ion Cell can be controlled with water. When water is used, however, hydrogen gas may evolve. In a confined space, hydrogen gas can form an explosive mixture. In this situation, smothering agents are recommended to extinguish the fire.</p> <p>涉及锂离子电池的火灾可以用水控制。然而，当使用水时，氢气可能会析出。在密闭空间中，氢气可以形成爆炸性混合物。在这种情况下，建议使用窒息剂灭火。</p>
Protective Equipment and precautions for firefighters 消防员的防护装备和注意事项	<p>As for any fire, evacuate the area and fight the fire from a safe distance. Wear a pressure-demand, self-contained breathing apparatus and full protective gear. Fight fire from a protected location or a safe distance.</p> <p>Use NIOSH/MSHA approved full-face self-contained breathing apparatus (SCBA) with full protective gear.</p> <p>对于任何火灾，应撤离该区域并在安全距离内灭火。佩戴压力要求、自给式呼吸器和全套防护装备。在受保护的地点或安全距离灭火。使用NIOSH/MSHA批准的带全套防护装备的全脸自给式呼吸器（SCBA）。</p>
NFPA	Health: 0 Flammability: 0 Instability: 0

Section 6 – Accidental Release Measures 泄漏处置措施

Personal Precautions, protective equipment, and emergency procedures 个人预防措施、防护设备和应急程序	Restrict access to area until completion of clean-up. Do not touch the spilled material. Wear adequate personal protective equipment as indicated in Section 8. 在清理完成之前，限制进入该区域。不要触摸溢出的材料。如第8节所示，穿戴足够的个人防护装备。
Environmental Precautions 环境注意事项	Prevent material from contaminating soil and from entering sewers or waterways. 防止材料污染土壤和进入下水道或水道。

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Methods and materials for Containment 安全壳的方法和材料	Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately. 在安全的情况下停止泄漏。用干沙子或泥土将溢出的液体控制住。立即清理溢出物。
Methods and materials for cleaning up 清理方法和材料	Absorb spilled material with an inert absorbent (dry sand or earth). Scoop contaminated absorbent into an acceptable waste container. Collect all contaminated absorbent and dispose of according to directions in Section 13. Scrub the area with detergent and water; collect all contaminated wash water for proper disposal. 用惰性吸收剂（干沙子或泥土）吸收溢出的材料。将受污染的吸收剂舀到可接受的废物容器中。收集所有受污染的吸收剂，并按照第13节中的指示进行处理。用洗涤剂和水擦洗该区域；收集所有受污染的洗涤水以便妥善处理。

Section 7 – Handling and Storage 操作和储存

Handling 操作	Don't handling Li-ion Battery with metalwork. Do not open, disassemble, crush or burn battery. Ensure good ventilation/ exhaustion at the workplace. Prevent formation of dust. Information about protection against explosions and fires: Keep ignition sources away-Do not smoke. 不要用金属制品处理锂离子电池。不要打开、拆开、挤压或燃烧电池。确保工作场所通风良好/精疲力竭。防止灰尘的形成。 关于防止爆炸和火灾的信息：远离火源，不要吸烟。
Storage 储存	Short period less than 1 month: -20°C~+60°C, 45~75% RH Max; within 3 months: -20°C~+35°C, 45~75% RH Max; Long term within 1 year: -5°C~+25°C, 45~75% RH Max. The battery should be stored in a clean, dry and ventilated room with an ambient temperature of -5°C~25°C, avoid contact with corrosive substances, and keep away from fire and heat sources. The battery is charged every three months during storage. 短期小于 1 个月：-20°C~+60°C，最大相对湿度 45~75%； 3 个月内：-20°C~+35°C，最大相对湿度 45~75%； 1 年内长期：-5°C~+25°C，最大相对湿度 45~75%。 蓄电池应存放在清洁、干燥、通风的室内，环境温度为-5°C~25°C，避免接触腐蚀性物质，远离火源和热源。蓄电池在储存期间每三个月充电一次。 Do not storage Li-ion Battery haphazardly in a box or drawer where they

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	<p>may short-circuit each other or be short-circuited by other metal objects. Do not expose Li-ion Battery on heat or fire. Avoid storage in direct sunlight. Do not store together with oxidizing and acidic materials. Keep container tightly sealed.</p> <p>不要将锂离子电池随意存放在可能相互短路或被其他金属物体短路的盒子或抽屉中。请勿将锂离子电池暴露在高温或火灾中。避免存放在阳光直射下。不要与氧化性材料和酸性材料一起存放。保持容器密封。</p>
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Section 8—Exposure Controls and Personal Protection 暴露控制和个人防护

<p>Engineering Controls 工程控制</p>	<p>Use local exhaust ventilation or other engineering controls to control sources of dust, mist, fumes and vapor.</p> <p>Keep away from heat and open flame. Store in a cool, dry place.</p> <p>使用局部排气通风或其他工程控制来控制灰尘、薄雾、烟雾和蒸汽的来源。</p> <p>远离热源和明火。存放在阴凉、干燥的地方。</p>
<p>Personal Protective Equipment 个人防护设备</p>	<p>Respiratory Protection: Not necessary under normal conditions. 呼吸保护：正常情况下不需要。</p> <p>Skin and body Protection: Not necessary under normal conditions, Wear neoprene or nitrile rubber gloves if handling an open or leaking battery.</p> <p>皮肤和身体保护：在正常情况下没有必要，如果处理打开或泄漏的电池，请戴上氯丁橡胶或丁腈橡胶手套。</p> <p>Hand protection: Wear neoprene or natural rubber material gloves if handling an open or leaking battery.</p> <p>手部防护：如果处理打开或泄漏的电池，请戴上氯丁橡胶或天然橡胶材料的手套。</p> <p>Eye Protection: Not necessary under normal conditions, Wear safety glasses if handling an open or leaking battery.</p> <p>眼睛保护：在正常情况下没有必要，如果处理开路或泄漏的电池，请佩戴安全眼镜。</p>
<p>Other Protective Equipment 其他防护设备</p>	<p>Have a safety shower and eye wash fountain readily available in the immediate work area.</p> <p>在紧邻的工作区域配备安全淋浴和洗眼器。</p>
<p>Hygiene Measures 卫生措施</p>	<p>Do not eat, drink, or smoke in work area. Maintain good housekeeping.</p> <p>请勿在工作区域内进食、饮水或吸烟。保持良好的内务管理。</p>

Section 9 – Physical and Chemical Properties 物理和化学特性

Physical State 物理状态	Form: Solid 形式: 固体
	Color: Black 颜色: 黑色的
	Odour: Odorless 气味: 无色无味
Change in condition 条件变化: :	
pH, with indication of the concentration pH, 带有浓度指示	Not available 不适用的
Melting point/freezing point 熔点/冰点	Not available 不适用的
Boiling Point, initial boiling point and Boiling range 沸点、初始沸点和沸程	Not available 不适用的
Flash Point 闪点	Not available 不适用的
Upper/lower flammability or explosive limits 可燃性或爆炸性上限/下限	Not available 不适用的
Vapor Pressure 蒸汽压力	Not available 不适用的
Vapor Density: (Air=1) 蒸汽密度: (空气=1)	Not available 不适用的
Density/relative density 密度/相对密度	Not available 不适用的
Solubility in Water 在水中的溶解度	Not available 不适用的
n-octanol /water partition coefficient 正辛醇/水分配系数	Not available 不适用的
Auto-ignition temperature 自燃温度	Not available 不适用的
Decomposition temperature 分解温度	Not available 不适用的

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Odour threshold	Not available
气味阈值	不适用的
Evaporation rate	Not available
蒸发率	不适用的
Flammability (soil, gas)	Not available
易燃性 (土壤、气体)	不适用的
Viscosity	Not available
	不适用的

Section 10 – Stability and Reactivity 稳定性和反应活性

Stability 稳定性	The product is stable under normal conditions. 产品在正常条件下是稳定的。
Conditions to Avoid (e.g. static discharge, shock or vibration) 应避免的条件 (例如静电放电、冲击或振动)	Do not subject Li-ion Battery to mechanical shock. Vibration encountered during transportation does not cause leakage, fire or explosion. Do not disassemble, crush, short or install with incorrect polarity. Avoid mechanical or electrical abuse. 不要使锂离子电池受到机械冲击。 运输过程中产生的振动不会导致泄漏、火灾或爆炸。不得拆卸、挤压、短路或极性不正确的安装。避免机械或电气滥用。
Incompatible Materials 不相容材料	Not available 不适用的
Hazardous Decomposition Products 危害分解物	This material may release toxic fumes if burned or exposed to fire 如果燃烧或暴露在火中，这种材料可能会释放有毒烟雾
Possibility of Hazardous Reaction 危险反应的可能性	Not available 不适用的

Section 11 – Toxicological Information 有害物质信息

Irritation 刺激性	Risk of irritation occurs only if the cell is mechanically, thermally or electrically abused to the point of compromising the enclosure. If this occurs, irritation to the skin, eyes and respiratory tract may occur.
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	只有当电池被机械、热或电滥用到损害外壳的程度时，才会有刺激的风险。如果发生这种情况，可能会刺激皮肤、眼睛和呼吸道。
Sensitization 致敏性	Not available 不适用的
Neurological Effects 神经系统影响	Not available 不适用的
Teratogenicity 致畸性	Not available 不适用的
Reproductive Toxicity 生殖毒性	Not available 不适用的
Mutagenicity (Genetic Effects) 致突变性（遗传效应）	Not available 不适用的
Toxicologically Synergistic Materials 毒理学协同材料	Not available 不适用的

Section 12 – Ecological Information 生态信息

General note 一般说明	Water hazard class 1(Self-assessment): slightly hazardous for water. Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system. 水危害等级 1 (自我评估)：对水有轻微危害。不要让未稀释的产品或大量产品进入地下水、水道或污水系统。
Anticipated behavior of a chemical product in environment/possible environmental impact/ecotoxicity 化学品在环境中的预期行为/ 可能的环境影响/生态毒性	Not available 不适用的
Mobility in soil 土壤中的流动性	Not available 不适用的
Persistence and Degradability 持久性和可降解性	Not available 不适用的
Bioaccumulation potential 生物累积潜势	Not available 不适用的
Other Adverse Effects 其他不利影响	Not available 不适用的

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Section 13 – Disposal Considerations 废弃处理

Product disposal recommendation: Observe local, state and federal laws and regulations. Packaging disposal recommendation: Be aware discarded batteries may cause fire, tape the battery terminals to insulate them.

Don't disassembly the battery. Completely discharge containers (no tear drops, no powder rest, scraped carefully). Containers may be recycled or re-used. Observe local, state and federal laws and regulations.

产品处置建议：遵守当地、州和联邦法律法规。包装处理建议：注意丢弃的电池可能会引起火灾，用胶带将电池端子绝缘。不要拆卸电池。完全卸下容器（没有泪滴，没有粉末残留，仔细刮）。容器可以回收或重复使用。遵守当地、州和联邦法律法规。

Section 14 – Transport Information 运输信息

For the international transport of lithium batteries, they must comply with these regulations: The International Maritime Dangerous Goods (IMDG) Code by International Maritime Organization (IMO), Dangerous Goods Regulations (DGR) by International Air Transport Association (IATA) and Technical Instructions for the Safe Transport of Dangerous Goods by Air by International Civil Aviation Organization (ICAO). These regulations are based on the UN Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria. Lithium batteries which meet the requirements of UN38.3 (UN Manual of Tests and Criteria, Part III, subsection 38.3) could be transported by air and by sea as ordinary goods, otherwise should be transported according to Class 9, Packing Group II /IB hazardous goods.

对于锂电池的国际运输，它们必须遵守以下规定：国际海事组织（IMO）的《国际海运危险货物规则》、国际航空运输协会（IATA）的《危险货物条例》和国际民用航空组织（ICAO）的《航空危险货物安全运输技术说明》。这些规定基于《联合国危险货物运输建议、试验和标准手册》。符合UN38.3（《联合国试验和标准指南》，第三部分，第38.3小节）要求的锂电池可以作为普通货物通过空运和海运进行运输，否则应根据第9类，包装类别II/IB危险货物进行运输。

UN Number 联合国编号	
IATA 国际航空运输协会	UN3481
IMO 国际海事组织	UN3481
UN Proper shipping name 联合国正确的运输名称	
IATA 国际航空运输协会	LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT 锂离子电池内置在设备中
IMO 国际海事组织	LITHIUM ION BATTERIES CONTAINED IN EQUIPMENT 锂离子电池内置在设备中
Transport hazard class 运输危险类别	
IATA 国际航空运输协会	9
IMO 国际海事组织	9

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Transport information:

运输信息

The Rechargeable Li-ion Battery Pack (AST-NETBX-BAT) has passed the test UN38.3, according to the report number: 2502Y16422E-SF-01 issued on 2025-12-31 by BACL.

型号为AST-NETBX-BAT的锂离子电池组已经通过了UN38.3认证, 依据倍科发行的编号为2502Y16422E-SF-01的检测报告。

According to the Packing Instruction section II of 967 of IATA DGR Manual 67th Edition for transport by air.

根据国际航空运输协会DGR手册第67版包装说明967第 II 部分进行空运。

According to the Special provision 188 of IMDG CODE (Amdt.42-24) for transport by sea.

根据《国际海运危险货物规则》 (修订版42-24) 关于海运的特别规定188进行海运。

Section 15 – Regulatory Information 法规信息

1. Dangerous Goods Regulations
危险品规则
2. Recommendations on the Transport of Dangerous Good-Model regulations (24th revised edition)
关于危险货物运输示范条例的建议 (第 24 次修订版)
3. Recommendations on the Transport of Dangerous Good-Manual of Tests and Criteria
关于危险货物运输的建议试验和标准手册
4. International Air Transport Association (IATA)
国际航空运输协会
5. International Maritime Dangerous Goods (IMDG Code Amdt.42-24)
国际海运危险货物 (IMDG Code Amdt.42-24)
6. Technical Instructions for the Safe Transport of Dangerous Good
危险货物安全运输技术说明
7. Classification and code of dangerous goods (GB 6944-2012)
《危险货物分类和编码》 (GB 6944-2012)
8. 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200)
2012 OSHA 危险通信标准 (29 CFR 1910.1200)
9. Toxic Substance Control Act (TSCA)
《有毒物质控制法》
10. Code of Federal Regulations
《联邦法规》
11. In accordance with all Federal, State and local laws
根据所有联邦、州和地方法律

Section 16 – Other Information 其他信息

The information above is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. However we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no way shall

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*******End of Report 报告结束*******