



Leak Test of Lithium Battery

锂电池泄漏测试



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关于上腾 About Us

上腾科技，由原上腾电子标准品部门整合成立，隶属于阿普顿集团。专注气密检测技术领域的基础研究和标准产品的研发、生产，客户目标群涵盖汽车及零部件制造，消费电子，日用电器，厨房燃气用具，医疗及航空航天等众多领域。

作为泄漏测试领域的专家，上腾科技从 2005 年研发成立至今，一直致力于泄漏测试领域的研究，目前可生产制造空气压泄漏测试、氦气真空测试、流量测试、气体压力 / 流量曲线控制、电解液质谱测试等标准仪器，是国内为数不多的可提供 $10^{-10}\text{Pa}\cdot\text{m}^3/\text{s}$ 到 $5\text{m}^3/\text{min}$ 的全量程测试解决方案的供应商。

上腾科技目前立足于广州工厂第一生产线，并在广州、上海、杭州、天津设 4 个营销服务公司，另有北京、重庆、南京、郑州、西安、武汉、长春等服务点正在加速筹建中，40 多名销售及售后人员，可为用户提供优质的服务和贴心的使用体验。

Upton technology, established by the integration of the former Upton' s Standard instrument department. We focus on research in the field of leak test technology and standard product development and production. The target customers cover automotive and parts manufacturing, consumer electronics, household appliances, kitchen gas appliances, medical and aerospace and many other fields.

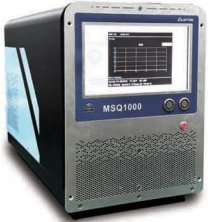
As an expert of leak test field, Upton technology devote ourselves to research of leak test from 2005. Now, we can produce and manufacture air leak tester, helium leak test system, flow tester, gas pressure and flow controller, electrolyte mass spectrum analyzer and other standard instruments, which is one of the few domestic can provide $10^{-10}\text{Pa}\cdot\text{M}^3/\text{s}$ to $5\text{m}^3/\text{min}$ full range test solutions suppliers.

At present, Upton technology is based on the research and development of Guangzhou factory, and has set up 4 marketing service companies in Guangzhou, Shanghai, Hangzhou, Tianjin. Beijing, Chongqing, Nanjing, Zhengzhou, Xi 'an, Wuhan, Changchun, and other service points are under preparation, which can provide users with high-quality service and thoughtful use experience.

适用产品及应用场景 Products and Applications



产品参数 Product Parameters



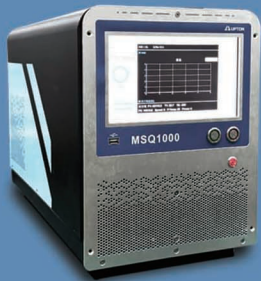
气质谱分析仪 Gas Mass Spectrum Analyser	气质谱分析系统 Gas Mass Spectrum Analysis System
型号 Model: MSQ1000	型号 Model: MSQ2000
电压及功耗 Power Supply: 220VAC, 50Hz, 300W	电压及功耗 Power Supply: 220VAC, 50Hz, 2000W
外观尺寸 Dimension: W300xH420xD820	外观尺寸 Dimension: W500xD1280xH1130(1700)
重量 Weight: 35KG	重量 Weight: 200KG
核心传感器 Core sensor : 四极杆质谱仪 (双阴极) Quadrupole mass spectrometer (dual cathode) /LIT (线性离子阱)	
最小可检测漏率 Minimum detectable leakage rate: 5.0E-7mbar.l/s	
检测分辨率 Test resolution: 1 amu, 采样速率 Sampling rate: 300ms/point max	
质谱可检测质量数范围 Testable mass number range: 1~100 amu	
可检测电解液溶剂 : DMC,EMC,DEC,PP 等 Detectable electrolytes: DMC, EMC, DEC, PP, etc.	

再次创新
Innovating Again

上腾科技（UPTON）在原有电池模组元件及电池总成常规检测的丰富经验下，借助常年的开发积累，推出电池专用检漏仪—MSQ1000 型专用检漏仪，并根据实际使用环境，整合集成为 MSQ2000 型检漏总成，可协助用户提高电池品质，赢得竞争优势。

UPTON Technology with rich experience in the conventional testing of original battery module components and battery assemblies, with the help of years of development and accumulation, launches a special leak tester for battery - MSQ1000 professional leak tester, and integrates into MSQ2000 leak tester assembly according to the actual use environment, which can help customers improve battery quality and win competitive advantage.

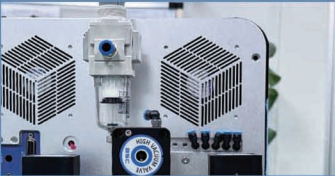
检漏精度相比压降法提高
1000倍
The test accuracy is 1000 times higher than that of the pressure decay



气质谱分析仪
Gas Mass Spectrum Analyzer
型号 Model: MSQ1000



中英文界面切换，10.1” 彩色触摸屏
Selectable Chinese and English,
10.1” color touchscreen



模块化结构，可轻松地集成至自动化生产中
Modularity structure, easily integrated into automated production

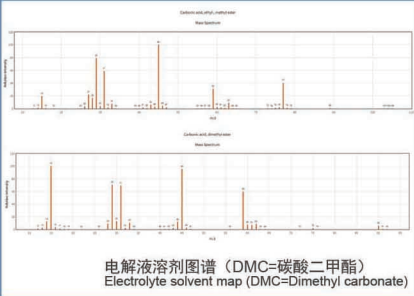
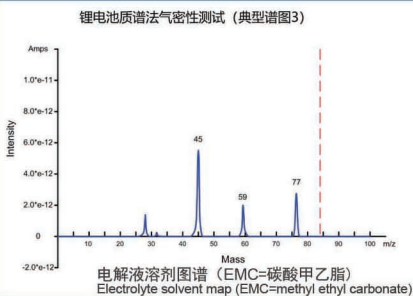
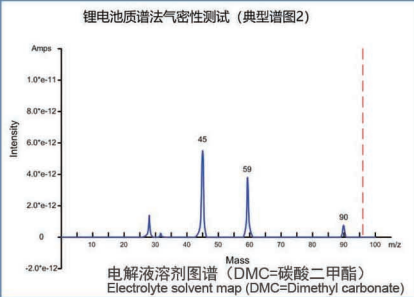
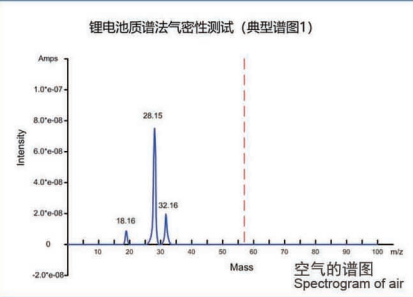


丰富的通讯端口，适用多种通讯要求和数据交互，可连接条码枪追踪质量数据。
Multiple communication ports, suitable for a variety of communication requirements and data interaction, can connect barcode scanner to track quality data



气质谱分析系统
Gas Mass Spectrum Analysis System
型号: MSQ2000

微米级检漏仪精度
是压力衰减检测精度的 1000 倍，可检测微米级别的微小漏孔
Leak tester of precision down to micrometer level
It is 1000 times the accuracy of pressure decay leak test and can detect micro leaks at the micrometer level



专用电解液测漏仪
Special leak tester for electrolyte

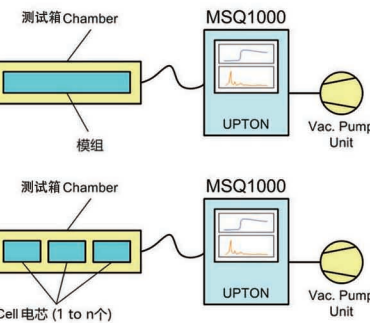
电池以及电池模组、动力电池包等在生活中随处可见，现已大量应用在汽车、手机、耳机等设备上，随着电池的广泛应用，电池的安全性越发重要，因此，电池在出厂前需要对其密封性进行检测。传统技术中，电池以及电池模组、动力电池包的密封完整性常用空气压力衰减法、氦质谱法、VOC 检测法、人工望闻问切等方法。这些现有方法中存在的问题主要有，无法检测微小的泄漏、电池的漏孔被电解液堵塞后无法检测、VOC 检测法容易被干扰。

基于此，通过针对性地检测电池是否出现特定物质的泄漏如电解液泄漏而对电池的密封完整性进行判断。

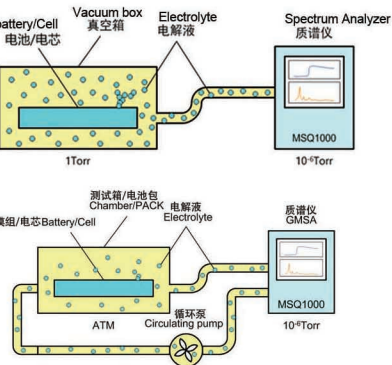
Batteries and battery modules, power battery packs, etc. are everywhere in life. They are widely used in automobiles, mobile phones, headphones and other devices currently. With the wide application of batteries, the safety of batteries becomes more important. Therefore, the sealing of batteries needs to be tested before they leave the factory. In traditional technology, the methods of air pressure decay, helium spectrum analysis, VOC test, manual observation are commonly used for the batteries and battery modules, sealing integrity of power battery packs, etc. The main problems in these existing methods are: unable to test small leaks, battery leaks can not be tested after blocked by electrolyte, VOC test methods are easily disturbed. Based on this, the sealing integrity of the battery can be judged by specifically testing whether there is leakage of specific substances such as electrolyte.

应用场景（一）Applications 1

锂电池质谱法气密测试（电芯/模组）
Leak test by mass spectrometry for battery (Cell/Module)

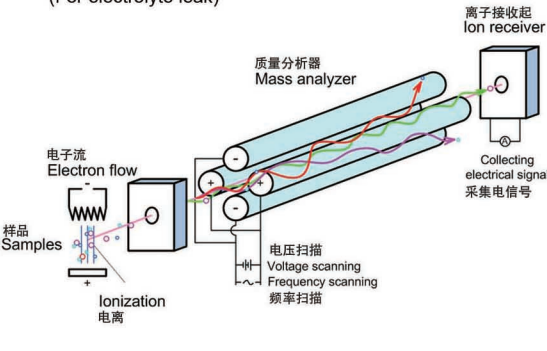


锂电池质谱法气密性测试示意图
Schematic diagram of battery leak test by mass spectrometry



系统检测原理 Test Principle

锂电池质谱法气密测试（漏液）测试
Leak test by mass spectrometry for battery (For electrolyte leak)



优势一览

Advantages

通过校准漏孔追溯测试结果
Tracing test results through calibrated leak

直接检测电解液挥发气体，对产品与环境温度干扰敏感度低
Can directly test volatile gases in electrolyte, with low sensitivity to product and environmental temperature interference

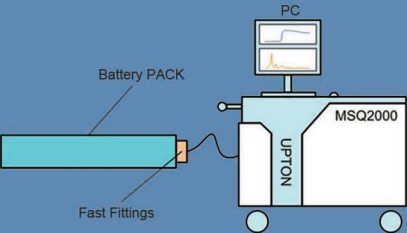
可检测大多数常用电解液溶剂 DMC, DEC, EMC, PP
Can test most commonly electrolyte: DMC, DEC, EMC, PP

可连接条码枪追踪质量数据
Can connect the barcode scanner to track the quality data

检测周期快，<1min
Fast testing cycle, <1min

应用场景（二）
Applications 2

锂电池质谱法气密性测试（包体）
Leak test by mass spectrometry for battery (PACK)



应用背景及解决办法 Applications and Solutions

目前的电池的泄漏测试，通常采用的仪器是VOC检测仪和氦质谱仪。VOC普遍的问题是测试结果很不稳定，对环境要求高，常常受到非电解液的VOC气体干扰，导致误判。而氦质谱检测要提前压氢，又由于氦气比较轻，在电解液中会存在上部，下部的孔隙可能会测不到。

气质谱分析仪MSQ1000，完美的解决了这个问题！
通过对样品气体分子电离后，离子经过质量分离器时，仅仅将有用的目标离子送入到检测器中，这大大提高了抗干扰性能！换句话说，我们的质谱是分析气体成分的，就是说1到100的质量数的物质，我一下全能测试出来，你关心哪个就测试哪个，不关心的也可以不扫描……

At present, traditional VOC tester and helium mass spectrometer are usually used to test the leak of battery. The common problem with VOC is that the test results are very unstable and require a high level of environment. It is often interfered by VOC gas of non-electrolyte, which leads to misjudgment. For helium mass spectrometry, helium need to be pressed into the battery before test. And due to helium is relatively light, it is present in the upper part of the electrolyte, so the lower part of the hole may not be tested.

The gas mass spectrum analyzer-MSQ1000-solves this problem perfectly!

After ionizing the sample gas molecules, when these ions pass through the mass separator, only useful target ions are fed into the receiver, which greatly improves the ability to resist interference. In other words, our mass spectrometry is for the analysis of gaseous components, that is, substances with mass numbers from 1 to 100 can be tested. You can test which one you care about. If you don't care, you can skip scanning...