



# 太阳能道钉灯

Solar Road Stud

处处阳光 处处电  
Where there is Solar there is Power

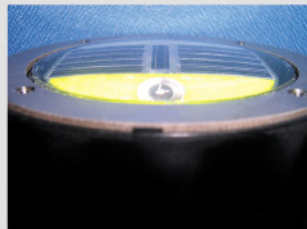


环态源科技发展（深圳）有限公司是一家致力于太阳能设备、风力发电设备、风光互补系统设备、道路交通设施设备等系列产品的研发、生产、销售、代理及工程施工与一体的港资公司。科技引领未来，随着智能化与科技的完美结合，在国家实施安保及再生洁净能源工程中，各种高科技含量的交通安全设施得到了广泛的应用，对提高公路行车安全性，减少交通事故的发生发挥了各自应有的作用，太阳能道钉灯就是其中一种，适用于夜间照明、应用于道路警告的一种智能化交通安管辅助设备；太阳能道钉灯正改变交通安全的未来，我公司研发的太阳能道钉灯在研发性能上取得了进一步的突破，核心性能有了更好的保障（抗压性强、密封性好、寿命长、发光强度大），能在恶劣的环境下使用，且能见度是普通道钉灯或道路反光漆的10倍：

- ◆ 在黄昏、雾天、阴天、雨天能够提高司机对分界线的可见度
- ◆ 在滑湿恶劣的路面上排除传统的道钉灯或反光漆模糊不可见的路况
- ◆ 在弯曲的道路上增加司机对路面的反应时间

Ecotech (Shenzhen) Ltd. is a Hong Kong-based company specializing in research and development, production, retail and wholesale of solar, wind, road traffic facilities and equipment and dual-sources energy supply systems and products. The solar road stud is a product line of our company. The smart solar road studs have strong resistance, high luminous intensity, good sealing and long life. They are perfectly suited for use as a night delineation aid. They provide superior hazard warning to road users and lie at the heart of intelligent traffic management systems. They are shaping the future of traffic safety by providing information to drivers about potential hazards directly in their field of vision, reducing accidents and saving lives. Solar road studs save lives and reduce casualties on the road by providing up to a tenfold increase in visibility, as well as better durability in the most demanding conditions. Key benefits include:

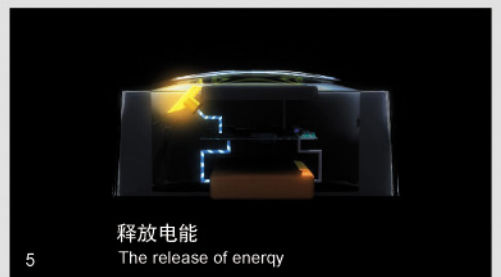
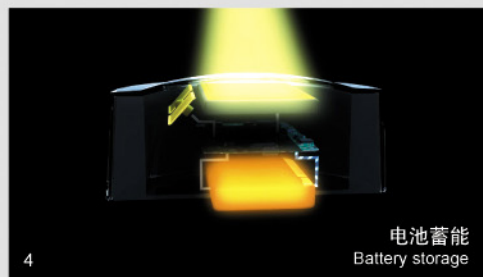
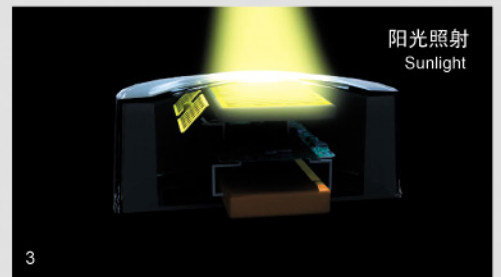
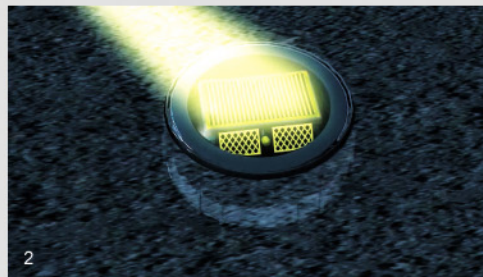
- ◆ Additional "preview" time for drivers on winding roads
- ◆ Ability to see road delineation in reduced visibility caused by fog, rain or surface spray
- ◆ Visible delineation on wet roads where white lines become invisible due to reflected light



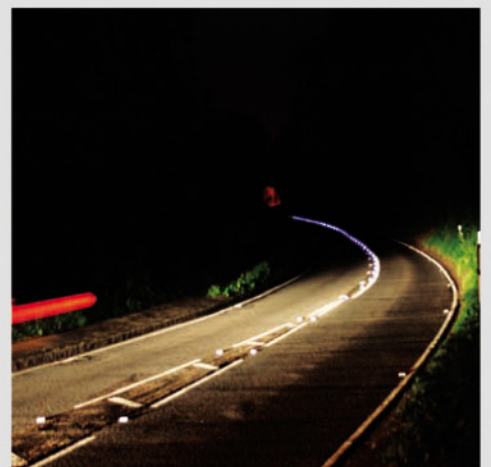
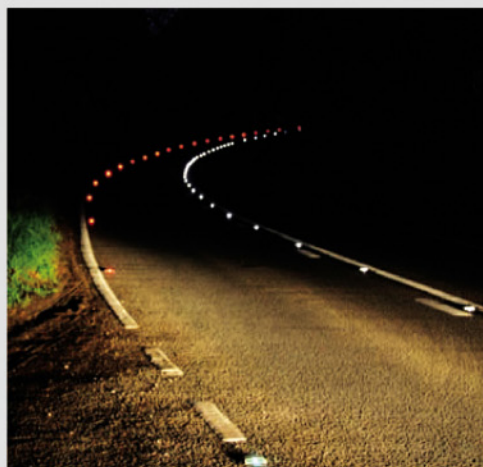
# 道钉灯原理

PRINCIPLE OF SOLAR ROAD STUDS

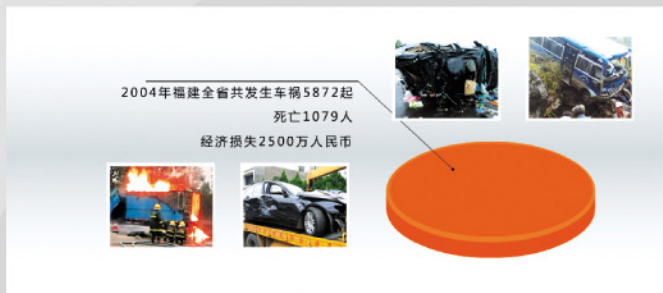
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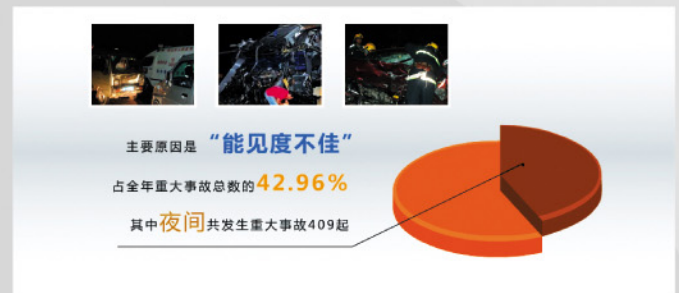
智能、安全、环保  
Smart, Safe and Sustainable







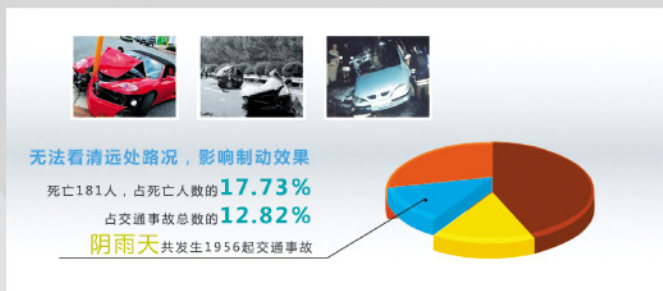
According to the official statistical information from the Fujian Province, there were 5872 car accidents in the province in 2004. These had resulted in a death toll of 1079 and an economic damage assessing to RMB25 million.



Of all the car accidents in the year, 409 serious accidents happened at night. This was 42.96% of all serious accidents. The main reasons of these accidents were low visibility and poor lighting.



198 serious accidents happened in the evening. This was 20.80% of all serious accidents. The major cause of these accidents was the sudden change in day light as dusk fell.



According to the statistical data, 1956 road accidents happened on rainy or cloudy days in the year and claimed 181 lives. This was 12.82% of all road accidents and 17.73% of overall death toll. The major cause of these accidents was due to the low range of visibility on rainy days. In rainy conditions, water on the road lowers the effectiveness of the braking system to stop or slow down a vehicle.



Foggy days were also prime time for accidents to happen, especially on highways, due to low visibility.



黄昏 Dusk



夜晚 Night



雾天 Foggy Day



雨天 Rainy Day



传统反射漆效果  
Traditional Retro-Reflectors



太阳能道钉灯效果  
Solar Road Studs

## 太阳能智能道钉灯 Intelligent Solar Road Studs

保持交通顺畅，拯救生命  
Moving Traffic, Saving Lives

这种太阳能道钉灯与传统的道钉灯路况相比，太阳能道钉灯的使用使司机对前方的路况提高10倍的敏感度，即使在雾天、雨天、昏暗的天气下都使道路可见度大大提高。在时速每小时100公里（每小时六十二英里），司机在安装太阳能道钉灯的路面上能有30秒的时间来反应路面情况，而在只有普通纯反光道钉灯的路面上，司机只有3.2秒的时间来反应路面情况。事实证明，使用道钉灯可以减少事故发生和挽救生命。

太阳能道钉灯比传统的道钉灯或反光漆更加的坚固和耐用，因此在产品寿命上相对传统的反光器更加有保障，且在没有路灯的情况下同样可使用。除了节省能源和维护成本之外，使用这种太阳能道钉灯能够减少光污染和降低二氧化碳的排放。

来自英国交通安全研究室的调查表明：在使用智能太阳能道钉灯之后，大大减少了司机开车越过路面分界线的可能，并能减少车辆高照灯的使用，减低来往车辆经过时造成让人措手不及的危险。除此之外，这种灯的安装也有利于自行车和摩托车的行车安全。

**使用太阳能道钉灯能带来安全、环保和经济效益方面的保障。其中包括：**

### 减少交通意外，保护生命安全

英国交通部门统计数据 displays，单一道路交通事故给国家造成的损失高达169万英镑（约RMB1636万），还未算及事故后对伤者或其亲属的影响。而太阳能道钉灯的使用能为当地或地区政府减少交通意外和保障行人的安全。根据晚间路上发生交通事故的记录，太阳能道钉灯的使用使事故发生率降低了70%以上。

### 降低维护成本

太阳能道钉灯相对传统的道钉灯所需的维护更少。国家公路组织机构部门要求每年至少检查所有的道钉灯两次，而且如果出现以下的情况就要更换道钉灯：多于10%的道钉灯坏了，或者连续10个道钉灯不见或损坏了，或者任何一个道钉灯出现松动的情况下，或者在必需道钉灯的区域里，例如双白线区域有一个道钉灯不见了都需要更换道钉灯。实践证明太阳能道钉灯比传统的道钉灯更加耐用和可靠，在正常使用情况下它们可连续工作5-8年，是一种安全、智能、环保的设备。

### 太阳能道钉灯应在哪里使用？

新一代高速公路环保照明，及任何一个存在交通隐患或地形弯曲不平路况恶劣的道路上都适合使用太阳能道钉灯。太阳能道钉灯有利于司机在能见度低的路况下行车，例如有雾，下雨或阴暗的天气。在起到减少严重交通事故和挽救生命的效果上，传统道钉灯相对于比它照明距离大十倍的太阳能道钉灯来说是望尘莫及的。不但成本低寿命长，太阳能道钉灯并且环保又有效地预防交通事故的发生。

智能、安全、环保  
Smart, Safe and Sustainable

Solar road studs provide the driver a ten-fold increase in visibility of the layout of the road ahead. At a speed of 100km/h (62mph) they give drivers over thirty seconds to react to road conditions compared with just 3.2 seconds for conventional retro-reflective units. This has been proved to reduce the number of accidents and save lives.

Research carried out by the Transport Research Laboratory of U.K. shows that when the smart solar road studs are used, drivers are significantly less likely to cross the white line in the centre of a road. The studs reduce the use of headlight main beam and the risk of dazzling oncoming drivers. In addition, the flush fitting studs are also safer for cyclists and motorcyclists.

There are additional benefits in low visibility environments (rain and fog or surface spray) where traditional retro-reflectors and road markings are less visible. self-illuminating studs mean that road delineation remains visible even under these conditions.

Solar flush studs are more robust and durable than traditional units. They therefore have a lower whole-life cost than a retro-reflective road stud.

Solar Road Studs can provide delineation without streetlights. In addition to savings on energy and maintenance costs, the use of studs can result in a reduction in light pollution and much lower environmental audit score as no CO2 emissions are produced by the solar-powered units.

**There are many safety, environmental and financial benefits in specifying the use of the Solar Road Stud, including:**

### Fewer accidents, lives saved

Each fatality on UK roads is calculated by the Department for Transport to cost over £ 1.69M, in addition to the dreadful personal consequences to the bereaved and those affected by the accident.

The use of road studs can formulate a visible part of an overall casualty reduction program for a local or regional authority. Reduced congestion and road closures as a consequence of fewer accidents. On roads with noted records of night-time accidents, the use of road studs has demonstrated reductions in accident rates of over 70%.

### Lower In-Service Costs

Solar Road Studs require less maintenance than the traditional road stud. The Highways Agency has a requirement, under TD26/04 for all studs to be checked at least twice a year and replaced if more than 10% are not working, or 10 consecutive studs are missing / not working, or if any single stud has a loose casing, or a single stud is missing in legal requirement areas such as double white lines.

With an operating life of between five and eight years under normal condition, road studs have consistently proved to be five times more durable and reliable than the conventional retro-reflective road stud. They are the safe, smart and sustainable solution.

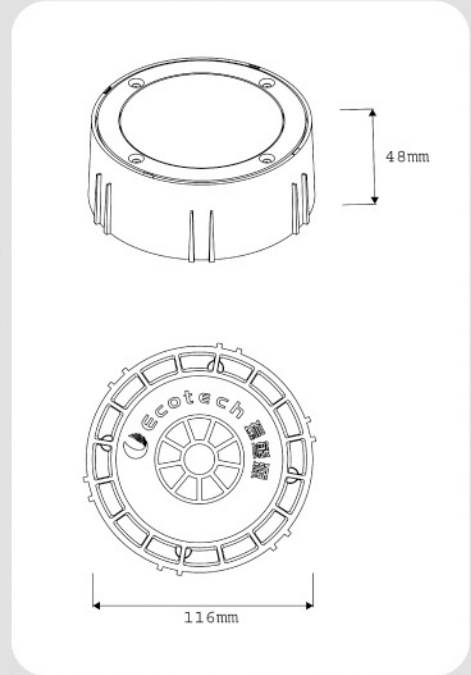
### Where should solar road studs be used?

Any site where there is a high accident risk or potential risk, usually on twisting or winding roads which suffer poor delineation. Solar road studs also provide benefits on any road in conditions of reduced visibility caused by fog, rain or surface spray. The ability to see the direction of the road ahead for a ten-times greater distance can make the difference between a serious accident and staying safe. With lower maintenance costs and a longer operating life, Solar road studs offer a very cost effective and environmentally friendly measure in accident prevention, including where street lighting costs are prohibitive or undesirable.



表一：产品规格

品牌	环态源
型号	DD-SR-001/(W、B、R、Y、G)
LED规格	2 X 5mm
LED颜色	白、蓝、红、黄、绿
工作模式	连续
充电时间	8小时
工作时间	160小时
工作温度范围	-20 C~+70 C
可视距离	800m
寿命	6年
承载力	15吨
尺寸	Φ 116 × 48 mm
重量	0.50kg



\* 符合国标GB/T 19813-2005

\* Specifications may be changed without notice

表二：产品对比

品牌	环态源	品牌1	品牌2	品牌3	品牌4
太阳能电池规格	0.24W	0.20W	0.30W	0.36W	0.30W
充电时间	8小时	8小时	8小时	8小时	8小时
工作模式	连续	连续	4Hz	1Hz	5Hz
平均耗电量	12mW	80mW	40mW	40mW	25mW
工作时间	160小时	20小时	60小时	72小时	96小时
可视距离	800m	800m	500m	500m	800m
寿命	6年*	5年	3年	3年	3年
承载力**	15吨	20吨	10吨	5吨	20吨
尺寸	Φ 116 × 48mm	135 × 130 × 27mm	Φ 116 × 21mm	105 × 105 × 20mm	110 × 90 × 30mm
重量	0.50kg	0.70kg	0.29kg	0.40kg	0.26kg

\* 专利产品

\* 国标荷载应要超过10吨

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