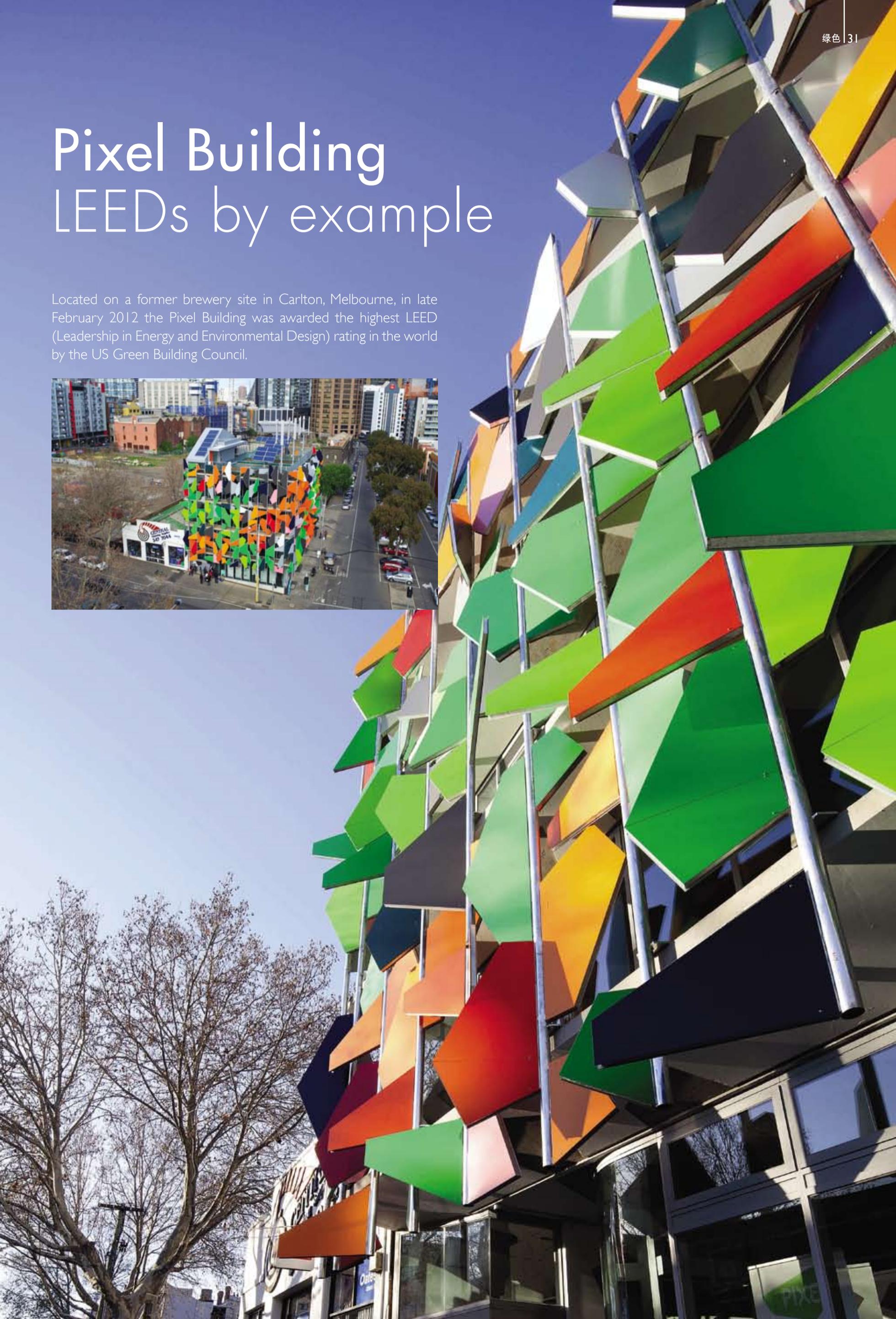
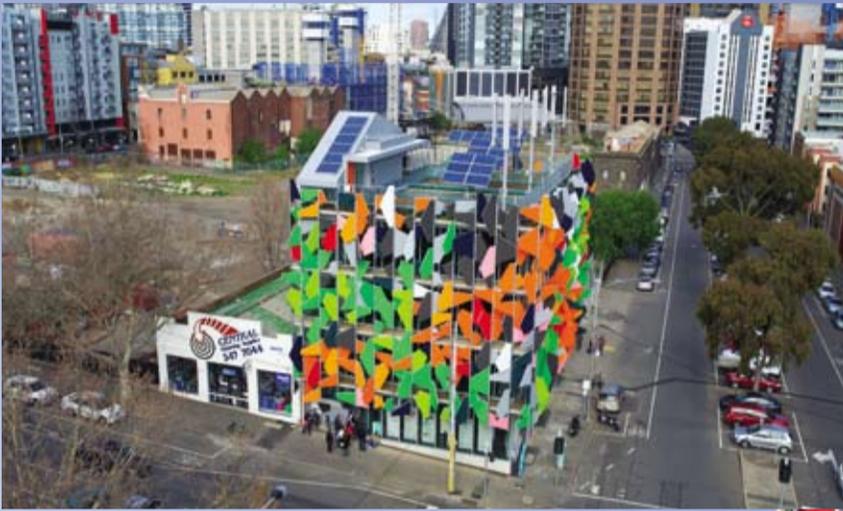


# Pixel Building LEEDs by example

Located on a former brewery site in Carlton, Melbourne, in late February 2012 the Pixel Building was awarded the highest LEED (Leadership in Energy and Environmental Design) rating in the world by the US Green Building Council.





"There are over 44,000 buildings in 120 countries around the world that have used the LEED rating system and in scoring 105 points Pixel has now surpassed all of them," said Chief Executive Officer, Grocon Group, Daniel Grollo.

The Pixel Building is a four-level building with a striking façade built as the first stage of Grocon's CUB Site redevelopment designed by architecture firm studio505 in conjunction with sustainability consultants Umow Lai. The former CUB Brewery site is also one of Melbourne's most significant and ambitious developments.

The Pixel Building currently ranks as the greenest commercial building in the world. LEED's rating of a perfect score of 100 points, plus an additional five points awarded for innovation, delivered the highest score ever. It is intended to rate the building under the LEED and BREEAM tools to establish the highest point scores to date granted under these international rating tools in order to set a benchmark against which all future buildings will be assessed by these schemes. Pixel is also targeting the highest BREEAM rating in the world to date but some of this is still dependent on further work to be undertaken in the fit out. The building also achieved a 6-Star, perfect score from Australia's Green Star system. Pixel is aiming to become Australia's first carbon neutral office building by offsetting all of its operational and embodied carbon emissions.

"It's a great result to have received such a high LEED rating and we look forward to the rating due soon from BREEAM, the UK rating system. To have a building with such acclaimed international sustainability ratings in the heart of Melbourne is truly a great achievement for Grocon," said Grocon Group National Executive Design Manager, David Waldren.

studio505 was approached by Grocon to design the Development Office (Pixel), the last building to be conceived on the site, and yet the first to be built. The brief was to provide

a 6 Star Greenstar Carbon Neutral home for the Development team and Sales Offices, a display suite area and a green roof top viewing area, for the duration of the development's construction and sales phase.

This also presented a timely opportunity to enhance Grocon's Green star credentials and provide a cost effective and outstanding building that would also reflect the standards that Grocon will demand in the remaining projects on the site. Carbon neutral and water balanced, the building contains an impressive array of sustainable design technologies and innovations, including wind turbines on the roof and fixed and tracking solar panels. The Pixel Building also generates all its own power and water on site.

studio505 directors Dylan Brady and Dirk Zimmermann said Pixel was the culmination of a wealth of ideas, vision and innovation in design, architecture and sustainability.

"The capacity to collaborate with like-minded individuals thinking 'outside the square' has been key in the successful delivery of Pixel and in ensuring its achievement of 105 LEED points," they said.

"studio505's involvement at Pixel included the research and development of the 'Living Edge' reed beds, creating shading and treating grey water collected from the building, as well as providing personal greenery to every office floor. The colourful panelised façade is complex and based not only on aesthetics, but also science, to allow maximum daylight, shade, views and glare control, whilst creating the building's identity."

The facade is a system of perimeter planters, fixed shading louvers, double glazed window walls and solar panel shading. studio505 developed a complex, yet simple, patterning system to engender the project with a human scale 'flow' of textures allowing the reading of the

various elevations, with their differing functional and ESD requirements and materials, to promote coherency through fluidity.

The Pixel Building is also carbon neutral, meaning that the renewable energy sources on the site are generating all of the energy that Pixel requires plus surplus energy to be fed back into the grid to offset the energy that was used and carbon generated in the manufacture of the materials and equipment used during construction.

The Pixel facade also includes smart window technology that automatically opens the windows of the facade on cool nights to enable the night air to flow into the building and cool the structure. Additionally, all of the air being distributed and used in the Pixel building is 100 per cent fresh air implementing sophisticated energy capture systems resulting in heat or cooling components being removed before the air is exhausted back into the environment, thus reducing overall energy use.

Pixel also implements an extensive photovoltaic array on the roof of the building mounted on a tracking device which will orient the panels towards the sun at all times of the year, thus maximising panel performance. The building also features new wind turbines installed for the first time at Pixel which outperform all other 1kW turbines currently in production worldwide.

Grocon also developed a new structural concrete design with the ability to halve the embodied carbon within the concrete mix, while achieving the same strength as traditional concrete. Pixelcrete also includes a high proportion of both reclaimed and recycled aggregates and dramatically reduces the content of Portland cement. With worldwide production of Portland cement accounting for nearly 6% of the world's greenhouse gas emissions every year, this product has a very significant potential worldwide impact.



The Pixel Building has also been designed to provide 100 per cent daylight penetration into the office space, whilst allowing screen based technologies to be deployed without the need for blinds on windows. Extensive 3D CAD modelling was undertaken to maximise the performance of the external sun-shade system to promote daylight penetration.

Water falling on the Pixel building as rainwater is collected after it has been used to irrigate the living roof. The rainwater will be stored in tanks before being treated by reverse osmosis to potable water standard. This treated water is then be distributed to all fixtures and fitting, within the building. The grey waste water is then filtered and directed to the living edge reed beds, where it is used to irrigate the reeds and plants. This process means that there will be no grey water waste leaving the Pixel Building site, dramatically reducing the flow of waste to the sewer.

Pixel is also the first project in Australia to implement small scale vacuum toilet technology reducing water consumption to an absolute minimum. A tank system at ground level holds all of the black waste from toilets and kitchen facilities. Methane is extracted from that waste and subsequently used as the energy source for hot water heaters on the roof that provide the hot water for showers that subsequently produce the grey water that irrigates the reed beds. The black waste is then sent to the sewer in a liquefied form and with reduced methane levels.

"We are very proud about our involvement in Pixel as it embodies our core values of striving to engineer innovative and sustainable environments," stated Umow Lai Director and Head of the Sustainability team, Shane Esmore. "Pixel was a real joy to work on. It's very rare in this industry to have a client prepared to let you push the boundaries so far into what is possible. Umow Lai were able to exercise the full range of our sustainability expertise in delivering a building that has reached the pinnacle of green building design."



# LEED 之代表作 - 像素馆

前身为啤酒厂的像素馆 (Pixel Building) 座落于墨尔本卡尔顿 (Carlton)，刚在2012年2月底在美国绿建筑协会所推动的领先能源与环境设计 (Leadership in Energy & Environmental Design, LEED) 评级系统中，获得全球最高的评分

Grocon 集团行政总裁 Daniel Grollo 先生表示：「全球现时120个国家中有超过44,000所建筑物使用 LEED 评级系统，而像素馆大厦获得前所未有的最高105分，成绩独占鳌头，超越其他所有建筑物。」

像素馆楼高四层，外观引人注目，是 Grocon 公司的 CUB (Carlton United Brewery) 重建项目的首阶段作品，项目由 studio505 建筑事务所联同可持续顾问公司 Umow Lai 所设计。这前身为啤酒厂的地方，是墨尔本当地最重要及雄心勃勃的发展之一。

像素馆现时蔚为全世界最环保的商业大厦，获得 LEED 有史以来最高的评分 - 100分，再因其创意获得额外5分，得到105分的最高总分。虽然像素馆在 BREEAM 的评级尚未公布，但相信大厦在 LEED 和 BREEAM 等国际评核工具中，誓必成为最高分数的指标。像素馆也达到了澳洲 Green Star (绿色环保之星) 建筑评估系统中，办公室设计v3版的最高六星评级，全因能抵销营运阶段和隐含的碳排放，成为了澳洲首幢碳中和的办公大楼。

Grocon 集团国家设计总经理 David Waldren 先生表示：「能够获得这么高的 LEED 评分，是我们的光荣；亦同时期待著根据英国 BREEAM 所发出的评分。能令墨尔本市中心有一所国际可持续评分成绩这么卓越的建筑物，对公司来说是一个重大的成就。」

Grocon 最初委托 studio505 为其发展办事处(像素馆)担任设计，是整个地段最后作设计、却最早建成的建筑物。设计纲要要求一所达到六级绿色环保之星及碳中和的办公楼，作为发展及销售团队的办事处，备有陈列室区域和绿色楼顶观景区，可于发展项目的建设及销售阶段使用。

大厦作为突显 Grocon 绿色环保之星表现的一个最佳机会，成为一所具成本效益和出色的楼宇，亦同时反映出集团在该地段及其他建筑物所要求的标准。大厦达到碳中和及用水平衡，蕴含了一系列可持续设计技术及创意，例如楼顶的风力涡轮发电机、固定和跟随太阳移动的太阳能电板、以及建筑本身自给自足的能量和用水。

studio505 总裁 Dylan Brady 和 Dirk Zimmermann 先生认为像素馆的成功，是融合了设计、建筑及可持续性等领域的崭新思维、远见及创意。

他们表示：「当中参与的一批志同道合人士，能够集思广益并跳出框架作思考，是像素馆能够成功兴建和获得 LEED 105 分的成功关键。」

「studio505 在像素馆中的工作包括研发 Living Edge 芦苇床系统、创造遮阳、处理灰水（或称中水，泛指卫生间和厨房用过的水）以及为每层写字楼提供个人化的绿化环境。颜色缤纷的面板化外墙是一个复杂的设计，它不止是美观装饰，却由科学出发，做出最高度的日光、遮阳、景观和眩光控制，又同时成为建筑物的特色。」

建筑物外墙是一个包含了周边植材槽、固定遮阳百叶、双层玻璃墙和太阳能电板遮阳的系统。studio505 开发了一个复杂却简单应用的模式系统，让项目加入了人类规模的「流动」素质，根据不同高度的录得数据、功能要求、静电限度和物料，促进在流动中达到一致性。

像素馆达到碳中和，即是大厦所产生的再生能源足以应付本身的能源需求，并有多余能源回馈电力网络，来抵销建设用之物料及器材在制造时所需的能源及碳排放量。

外墙装上了智能窗技术，在凉爽的晚上自动开放外墙窗户，把晚风引入建筑物内让结构降温。除此之外，像素馆内所有分配及使用的空气皆是百分百的新鲜空气，通过先进的能源补集系统，把当中加温或降温元素在排放到环境之前去移除，从而减低整体能源使用量。

大厦顶部安装了庞大的光电系统，加上追日设备，让太阳光电板长年朝向太阳，把面板的效益发挥到最高。像素馆设有最新及首次安装的风力涡轮发电机，其性能凌驾于现时全球所出产的一千伏特涡轮发电机。

Grocon 开发了崭新的结构用混凝土设计，使混凝土的隐含碳减半，同时维持到传统混凝土的强度。Pixelcrete 的成份大部份是工业废料、回收或再生材料，大大减低了传统的波特兰(矽酸盐)水泥含量。因为波特兰水泥的生产每年占了全球温室气体排放量的6%，这新产品 (Pixelcrete) 对全球将有很大的潜力和影响。

像素馆的设计让其办公室空间能够达到100%自然采光渗透，使用屏幕为本的技术而不需安装百叶，以及使用 3D CAD 作设计模拟，促使外部的遮阳系统和自然采光渗透得到最佳果效。大厦能够收集雨水，用作灌溉绿化楼顶，雨水也同时储存在桶内，经过反渗透处理后达到用水的水质标准。处理后的水会分流到建筑物内的不同装置设备。灰水会被过滤，分流到每层的 Living edge 芦苇床，用作灌溉植物。这过程使像素馆不会有灰水排放，大大地减少污水流入水道。

像素馆是澳洲首个采用小型真空马桶技术的项目，把水资源消耗减到最低。在地面层的储存槽系统，储存了所有来自厕所和厨房设备的污水，在当中抽取甲烷作为屋顶上热水锅炉的热能来源，用作提供热水淋浴，而淋浴所产生的灰水又用作灌溉芦苇床。污水最终的甲烷含量减低，并以液态流入水道。

Umow Lai 的可持续团队总裁及领导人 Shane Esmore 表示：「我们对于能够参与像素馆项目感到非常自豪，因为它体现了我们的核心价值观，就是努力设计具创意和可持续性的环境。能够参与像素馆工作是一个愉快的经验，在这行业中很少有客户会让我们把可能性推到极限。我们能够充分地运用公司全方位的可持续经验及专长，建立一所登上绿色建筑设计的巅峰的杰作。」