

隆重推出
Introduce New

净幕®

超长寿命

PuraWall® Max

SOLAR4EVER-ACTIVE TECHNOLOGY

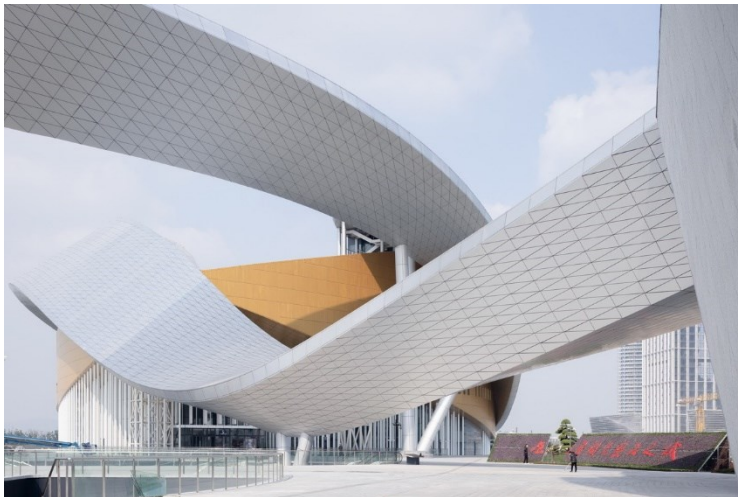
太阳能超级主动自洁阳极氧化铝板

Solar-powered Self-cleaning Anodized Aluminum Panel

当建筑外形被设计得越来越复杂
As buildings are designed to be
more and more complex

如何应对清洁困难的挑战？
How to deal with the
following cleaning challenge?

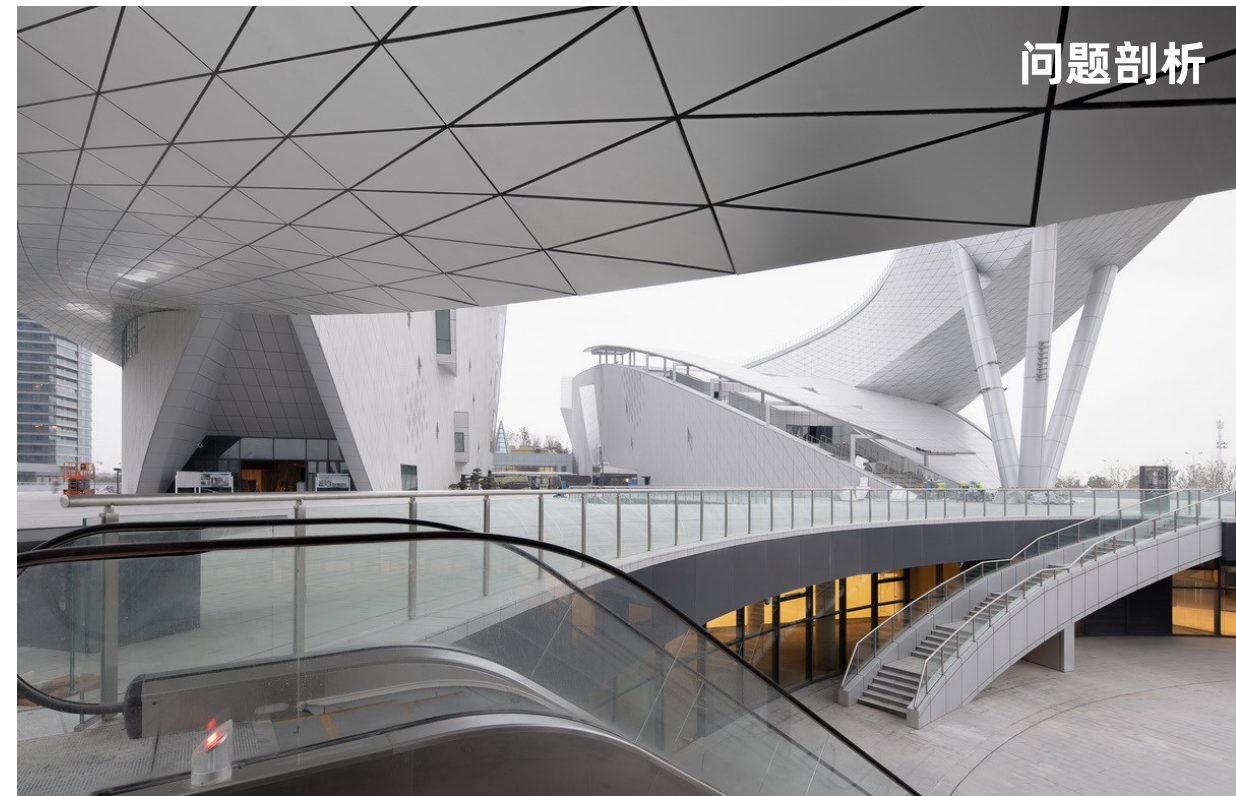
建成
Completion



苏州湾大剧院（江苏苏州）
Suzhou Bay Grand Theater

克里斯蒂安·德·包赞巴克
Christian de Portzamparc
项目年份：2020
Completion: 2020

问题剖析

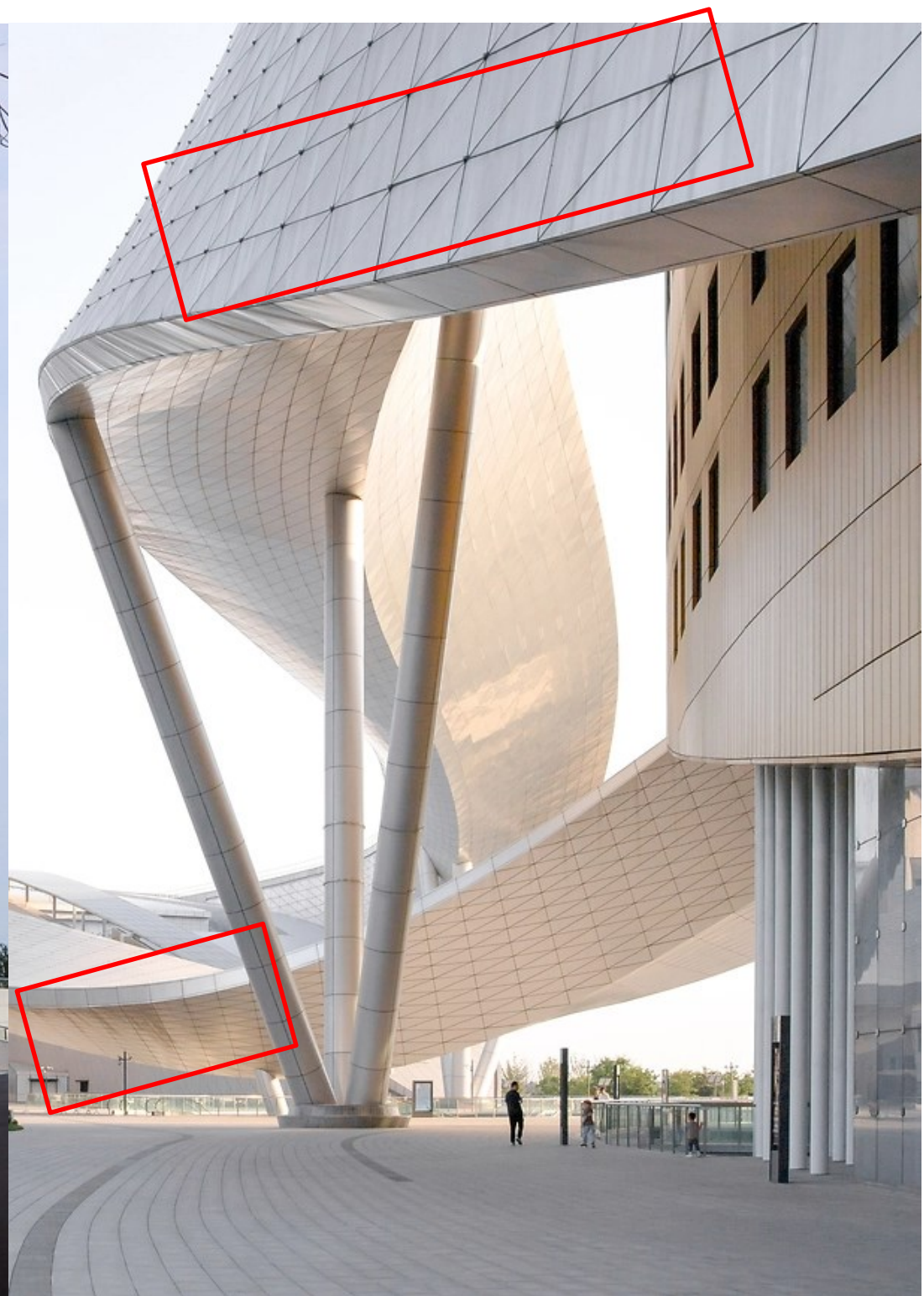


四年后

Four years later

问题剖析

1. 污染持续侵蚀；
2. 不当清洁造成腐蚀。

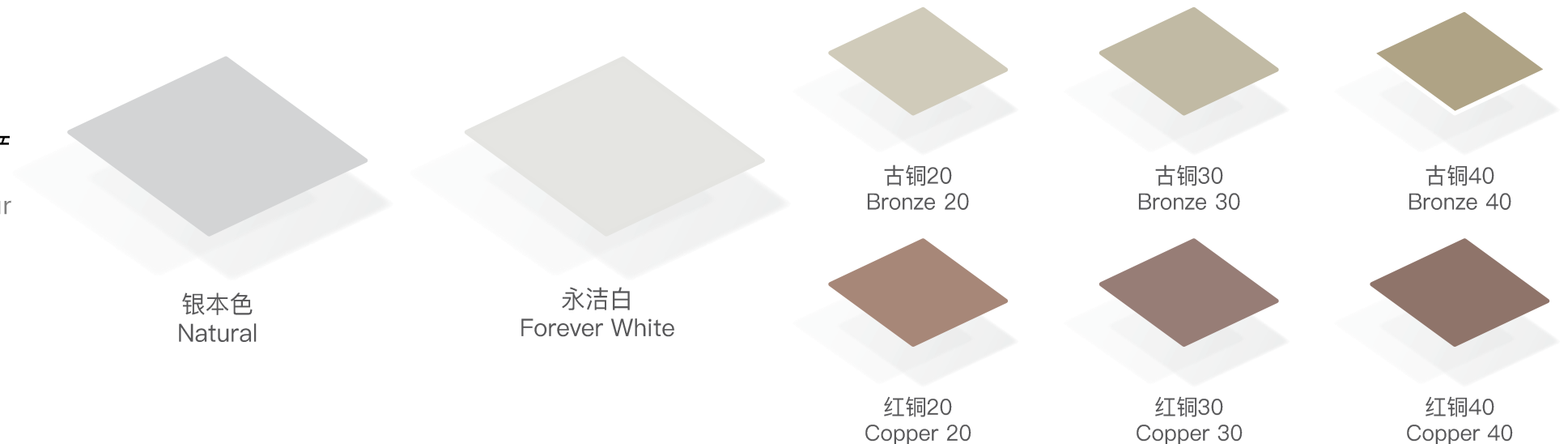


净幕® 太阳能超级主动自洁技术汲各家所长，是安美特创新研发出的全球领先的最优解决方案。

1. 光催化技术与氧化铝结合，时刻分解污染物；
 2. 结合氧化层无任何有机物，无自耗粉化，超长寿命25年+；
 3. 超亲水 ($WCA \leq 15^\circ$) 表面不留污渍不留痕。
- 业主几乎不用再清洗建筑外墙；
 - 适用于所有安美特产品表面（亚镜面、玄镜面、锦面.....）；
 - 是复杂造型建筑与大体量公共建筑应用广泛的理想外幕墙材料。

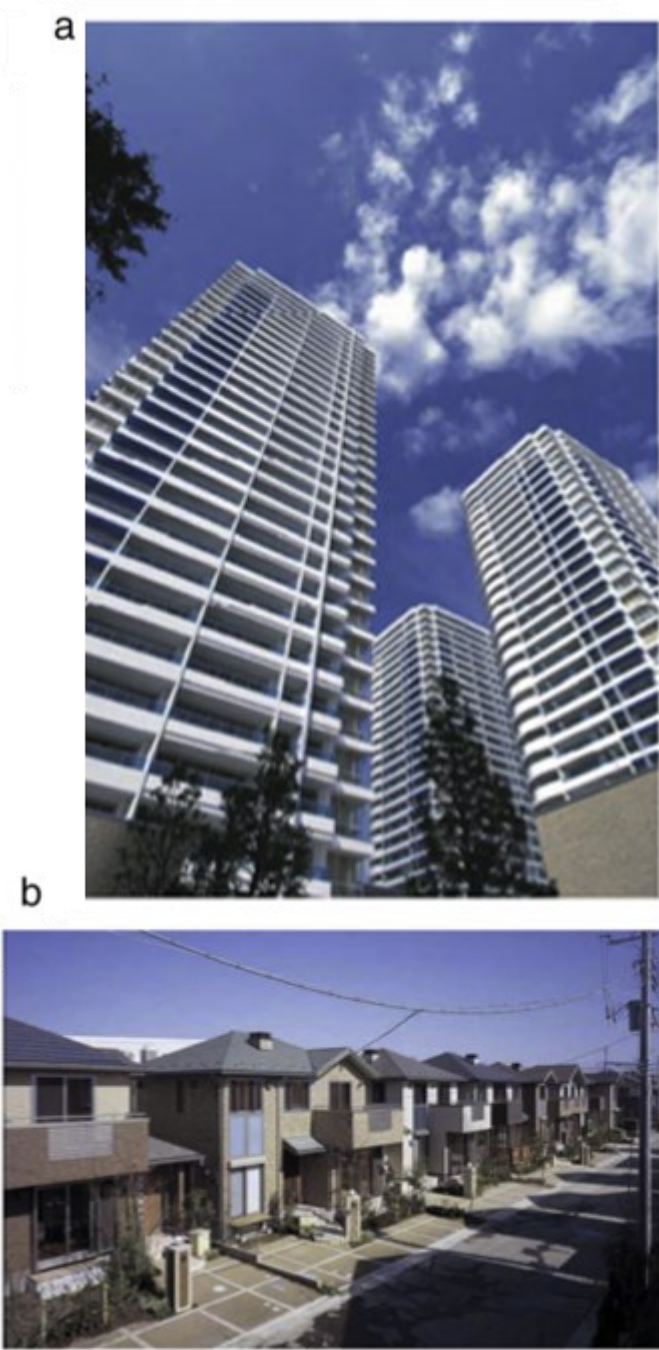
净幕® 太阳能超级主动自洁技术适配大部分安产品表面并可提供多种颜色选择。

The PuraWall[®] Max is compatible to most of our surfaces and we can provide following colors.





藤岛昭1942年3月10日出生于日本东京，是日本著名的光化学家，中国工程院外籍院士、欧洲科学院院士。毕业于日本东京大学应用化学专业，并在该校及美国德克萨斯大学奥斯汀分校深造，获得了丰富的学术背景和科研经验。
Akira Fujishima (born March 10, 1942) is a Japanese chemist. He graduated from the University of Tokyo with a degree in applied chemistry, and studied at the University of Texas at Austin, USA, gaining a rich academic background and scientific research experience.



光催化技术——藤岛昭与本多健一于1972年在*Nature*上发表了钛化合物单晶体表面在紫外光照射下可以分解有机物，被称为“本多-藤岛效应”（Honda-Fujishima Effect）。这一开创性科学发现及其随后的一系列重要成果，使得藤岛昭教授被广泛认为是诺贝尔奖的有力竞争者。
Photocatalysis technology - In 1972, a paper was published on the decomposition of organic matters when titanium dioxide is irradiated with light, which was called the "Honda-Fujishima Effect". This pioneering scientific research made Professor Akira widely regarded as a promising candidate for the Nobel Prize.

日本运用1000℃以上的高温烧结技术将钛化合物单晶体结合在瓷砖表面，使用了自清洁瓷砖的东京高层与一户建依靠自然环境中的太阳和雨水即可去除污垢，且30年房子亮丽如新。
但由于铝无法适应高温（铝的熔点为660°），因而烧结技术无法应用在铝的表面而只能涂覆含有钛化合物的涂料，其主要成分为有机物。
Japan uses high-temperature sintering technology to bond carbon dioxide single crystals to the surface of tiles. High-rises and single-family buildings with self-cleaning sintered tiles rely on the sun and rain in the natural environment to remove dirt and as bright as new in 30 years.
But the technology is not feasible to aluminum panels because the high-temperature exceeds the melting point (660°) of them and the main component of the self-cleaning coating is organic matter.

自洁型外墙建筑瓷砖的应用。
(a) 横滨 MM Towers 的图片，带有自洁瓷砖；
(b) 使用自洁瓷砖的一户建。
Application of self-cleaning exterior building materials.
(a) Picture of Yokohama MM Towers with self-cleaning tiles;
(b) Single-family building using self-cleaning tiles.

解决方案核心要点1 -- 光催化技术与氧化铝结合时刻分解污染物
Decompose pollutants into carbon dioxide and water

净幕®技术采用的就是藤岛昭先生的伟大发明，我们站在巨人的肩膀上，并且更跃进了一步。安美特绕过高温烧结，运用电化学技术将钛化合物单晶体与氧化铝合成在一起，作出了纯无机，永不自粉化的光催化氧化层。

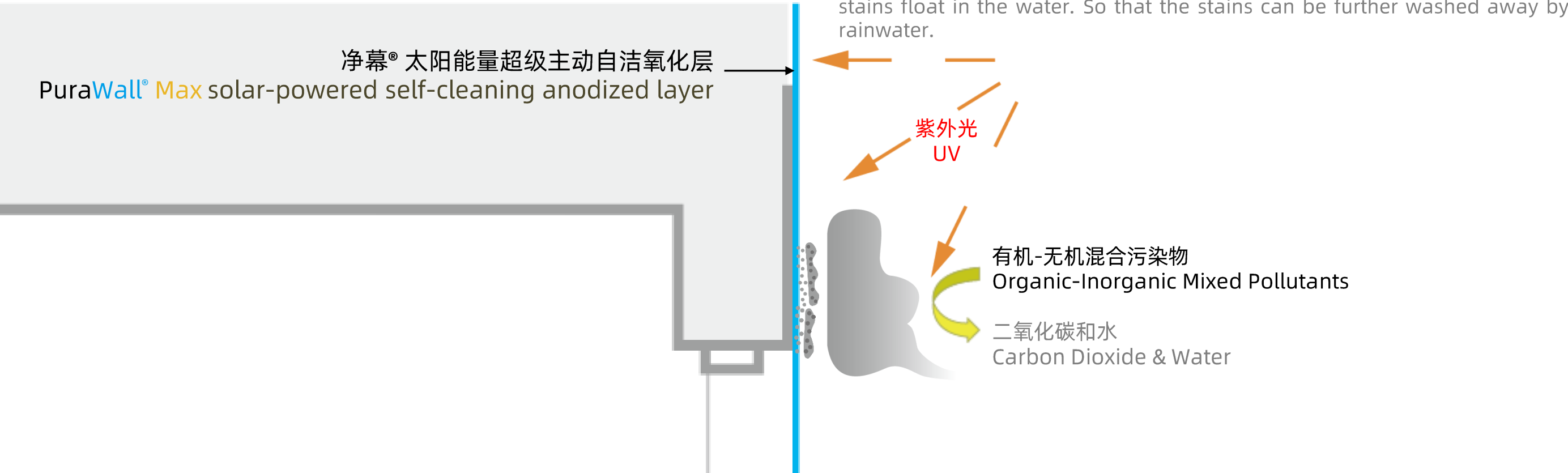
Anometal adopted Mr. Fujishima Akira's great invention, standing on the shoulders of giants and taking it a step further. We bypassed high-temperature sintering and used electrochemical technology to synthesize titanium single crystals and aluminum oxide, inventing a purely inorganic photocatalyst layer.

光催化层在太阳光中紫外线的照射下会从表面飞出电子，同时生成可氧化性很强的空穴。它们分别与空气中的氧气和水反应并生成具有极强分解和氧化能力的氧原子（O）与羟基（-OH）。这二者会将吸附在光催化表面的有机-无机混合污染物分解为二氧化碳和水。

同时，氧原子（O）与羟基（-OH）会吸附空气中的水分。使之很容易插入污物的下方而使其脱离表面，漂浮在水中，进而被雨水冲走。

When exposed to UV in sunlight, the titanium dioxide will release electrons and form electron holes which will react respectively with oxygen and water in the air to generate a single oxygen atom (O) and hydroxyl (-OH) with strong decomposition and oxidation capabilities. These two will decompose organic-inorganic mixed pollutants on the surface of the layer into carbon dioxide and water.

Water can easily permeate underneath the dirt and lift them off, letting the stains float in the water. So that the stains can be further washed away by rainwater.



• 实验室自洁性检测 ---分解有机物试验（甲基红）
检测标准：GB /T 23764-2009 光催化自清洁材料性能测试方法

检测项目 Item	分解有机物试验（甲基红）GB/T 31815-2015 Organic Matter Decomposition Experiment		实验室 Lab	耐候实验室 Weathering Lab
检测设备 Equipment	台式氙灯老化试验箱 Xenon-Arc Weather-Ometers [LRHS-48T-SN]		检测开始时间 Test Date	2024/07/23
	污染物指示剂 Pollution indicator: 甲基红Methyl Red			
试验样品 Samples (Initial Timeline)				
	净幕® 太阳能量超级主动自洁阳极氧化铝板 1件（图A） PuraWall® Max solar-powered self-cleaning anodized aluminum panel 1pc (Figure A) 普通氧化层铝板 1件（图B） Anodized aluminum panel 1pc (Figure B)	 (A)  (B)		

**照射6小时
6 Hours of Exposure**



(A)
净幕® 太阳能超级主动自洁阳
极氧化铝板
PuraWall® Max solar-powered
self-cleaning anodized
aluminum panel



(B)
普通氧化铝板
Anodized aluminum panel

**累计照射30小时
30 Hours of Accumulated Exposure**



(A)
净幕® 太阳能超级主动自洁阳
极氧化铝板
PuraWall® Max solar-powered
self-cleaning anodized aluminum
panel



(B)
普通氧化铝板
Anodized aluminum panel

相较于普通氧化铝板，净幕®太阳能超级主动自洁阳极氧化铝板表面有更优异的自洁能力
The PuraWall® Max solar-powered self-cleaning aluminum panel has better self-cleaning ability



氟碳涂层铝板
PVDF coating aluminum panel

净幕® 太阳能超级主动自洁阳极氧化铝板
PuraWall® Max solar-powered self-cleaning
anodized aluminum panel

解决方案核心要点2 -- 结合氧化层无任何有机物、无自耗、超长寿命25年+

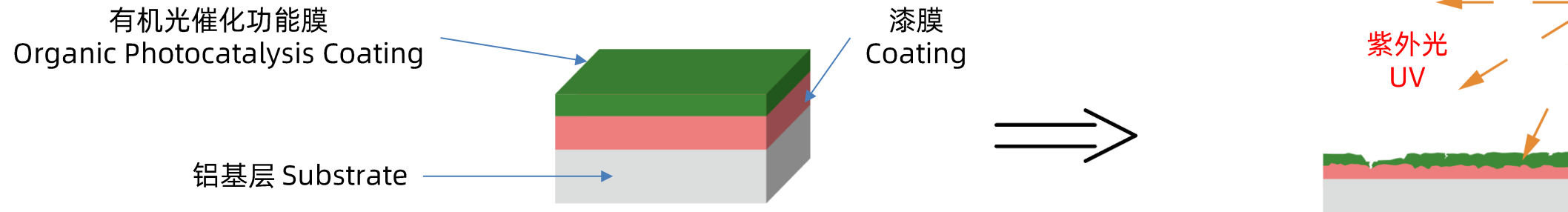
Contains no organic matters, providing a self-cleaning effect over 25 years

藤岛昭先生开发的基于钛化合物单晶体的自洁涂料，虽然能利用太阳光中的紫外线辐射进行自洁与自消毒，但涂料有自粉化性，寿命短。而净幕®太阳能量超级主动自洁阳极氧化层纯无机，永不自粉化，自洁性能与幕墙同寿命。对环境保护也是一种很好的贡献。

The self-cleaning coating will chalk and has a short lifespan. However, the self-cleaning and self-disinfecting properties of PuraWall® Max solar-powered self-cleaning anodized aluminum panel are the same as the façade in lifespan. It is also a great contribution to environmental protection.

有机光催化膜层：光催化的作用会破坏涂料中的有机成分从而自粉化。光催化性能越强，自洁性越强，涂层的自粉化损耗也就越严重，只在短期内有效。中长期来看，污染物只会加速沉积，造成铝板表面更加斑驳。

Organic photocatalyst coating: The photocatalyst layer also decomposes the coating itself during the photocatalytic process, resulting in self-consumption which leads to powdering and cracking. In the long run, pollutants will accumulate faster, causing the surface more mottled.



无机光催化阳极氧化层：钛化合物与三氧化二铝的结合层不含任何有机物，无自耗，革命性的自洁保护层可提供幕墙全生命周期内的自洁效果。

The Inorganic Anodized Photocatalysis Layer does not contain any organic matters which can provide a self-cleaning effect throughout the product lifecycle.

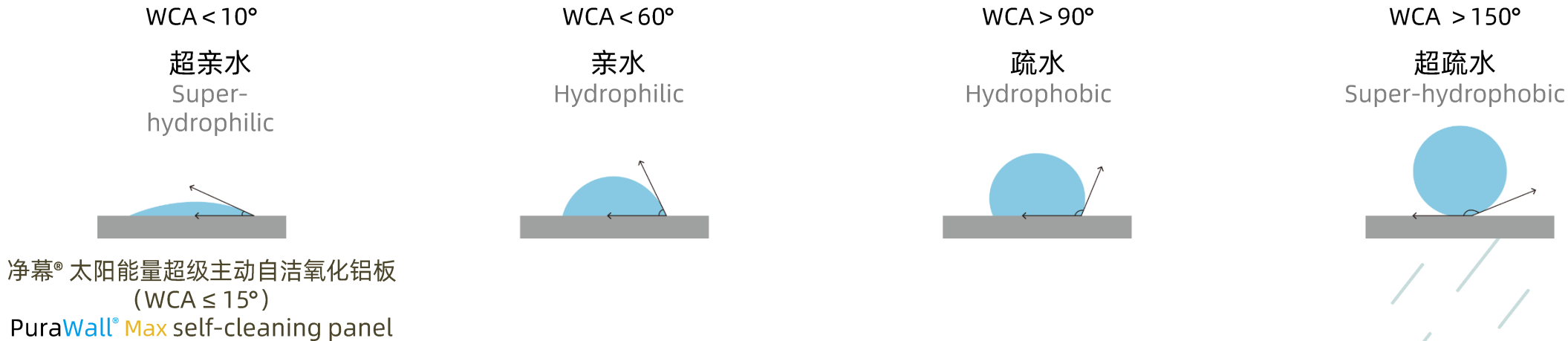
净幕® 太阳能量超级主动自洁氧化层
PuraWall® Max solar-powered self-cleaning anodized layer



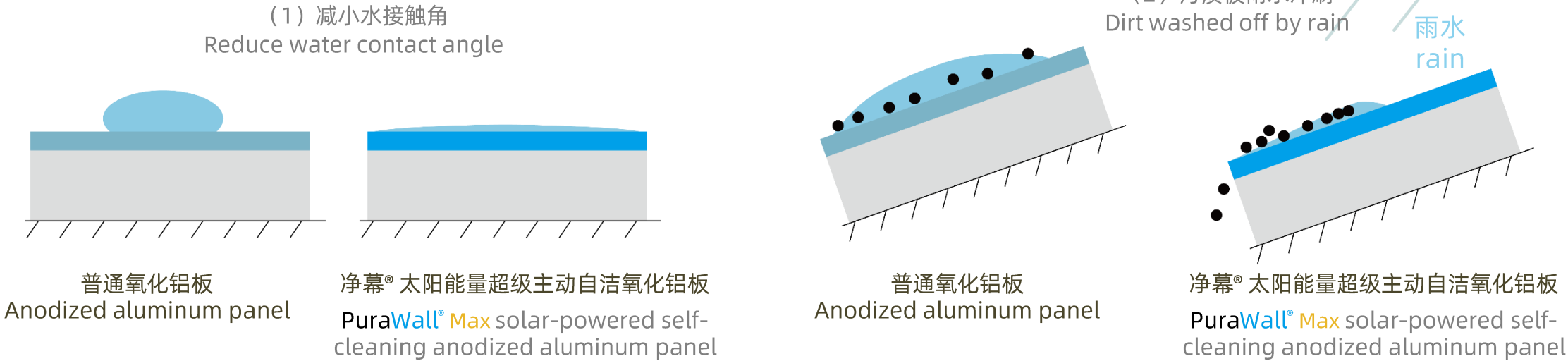
解决方案核心要点3 -- 水接触角 (WCA) $\leq 15^\circ$, 超亲水表面污渍不留痕
The super hydrophilic surface (WCA $\leq 15^\circ$) leaves no stains or marks

对光诱导的亲水性进行研究发现，紫外光会导致钛化合物单晶体表面具有超亲水性。这些研究成果在环境治理、能源转换等领域具有广泛的应用前景。
Research found that titanium single crystal has super-hydrophilic properties. These results have broad application prospects in the fields of environment and energy.

润湿能力 (水接触角)
Wettability (Water Contact Angle)



超亲水自洁原理
Work Principle of Super hydrophilic



总结 Conclusion

结合了光催化与超亲水两大自洁技术的净幕® 超级二合一主动清洁技术
一、超强光催化能力，利用阳光将污染物转化为二氧化碳和水；
二、超亲水（水接触角 $\leq 15^\circ$ ），雨水可轻易地冲走污染物。
净幕®这一全球领先且划时代的技术将几何级地延长幕墙抗污性能且几乎无需清洁维护。应用此技术的材料必将成为建筑行业
中一个令人振奋的选择！

PuraWall® Max that combines two powerful self-cleaning technologies

1. The photocatalyst layer decomposes pollutants into carbon dioxide and water with the energy of UV in sunlight.
2. The super hydrophilic surface ($WCA \leq 15^\circ$) leaves no stains or marks.

PuraWall® Max can greatly enhance the anti-pollution performance of facades and almost no need to clean and maintenance. This world-leading and epoch-making material will surely become an exciting choice in the architectural world!



Anometal

全球预表面处理铝材领导者

感谢观看

Thanks for watching