

CECO
ENVIRONMENTAL

希柯集团



SATTi & Adwest VOCs Control System
超尊及 Adwest 挥发性有机尾气处理系统

关于希柯环保

About CECO

希柯环保是一家总部位于美国俄亥俄州的纳斯达克上市公司。作为希柯环保集团旗下子公司，希柯环保中国公司在中国及亚太地区，推广公司旗下的大气污染控制、产物回收、流体处理与过滤、以及电力技术。希柯中国公司总部设于上海，从 2006 年起，中国公司已经开始在本土独资设立了销售部门和制造基地。通过在广州、江苏、上海设立工厂，充分提高了希柯中国公司的生产能力。

CECO Environmental is a Nasdaq-listed company headquartered in Ohio, United States. CECO-China is CECO Environmental's platform for the expansion of the company's Air Pollution Control, Product Recovery, Fluid Handling & Filtration, and Power technologies in China and Asia. Headquartered in Shanghai, PRC we have operated wholly owned company sales and manufacturing facilities since 2006 and have expanded our capabilities with additional locations in Guangzhou, Jiangsu and Shanghai.

关于希柯旗下 VOCs 处理系统两大品牌 - Adwest 和超尊

About CECO VOCs treatment brands-Adwest and SATTi

自 1988 年以来，希柯旗下 Adwest 品牌已经为世界各地客户安装了超过 1,150 台 Adwest 无焰蓄热式热氧化装置。我们为客户提供高成本效益的热氧化及催化氧化解决方案，有效减少化工气体，油气，以及酸性气体中的挥发性有机化合物（VOCs），气态有毒烟雾，以及恶臭气体。

2014 年 9 月 30 日，超尊环保科技（上海）有限公司加入希柯环保集团。超尊是中国大气污染控制市场上，挥发性有机化合物（VOCs）减排领域的领军企业。主要产品涉及有机废气处理系统、水洗塔系统、浓缩转轮系统、热回收系统（导热油炉、热风炉、废气余热利用设备等等）。产品广泛地应用于化工、涂装、电子、石化、医药、车辆制造等行业。SATTi 成功的基础在于为客户提供一种独特的解决方法，将新兴的工艺和创新的工程一起融入系统，大大提高了处理效率，降低了运行成本。

超尊与 Adwest 事业群具有很强的互补性，以满足专门的行业应用和工业操作条件。

Adwest, as a member of the CECO Environmental business group, provides cost effective thermal and catalytic oxidation solutions for abatement of Volatile Organic Compounds (VOCs), toxic air smog and odors from chemical, hydrocarbon, and acid gas process. Since 1988, over 1,150 flameless Regenerative Thermal Oxidizers have been installed by Adwest in the worldwide.

On September 30, 2014, CECO Environmental announced to acquire SAT Technology, Inc (SATTi), a leading provider of Volatile Organic Compounds (VOCs) abatement solutions among Chinese air pollution control market. SATTi can provide the products including organic waste gas treatment systems, water scrubber systems, concentrator systems and heat recovery systems (heat oil exchanger, air heater, exhaust heat recovery system, etc.) that are widely applied in chemical, coatings, electronics, petrochemical, pharmaceutical, and automotive manufacturing industries. The success of SATTi is based on its unique solution, which integrates new technology and innovative engineering into system, thereby greatly improving the processing efficiency and reducing operating costs.

SATTi and Adwest are highly complementary to meet industry-specific applications and industrial operating conditions.

蓄热式热氧化 (RTO) 挥发性有机污染物最佳的处理方式

Regenerative thermal oxidation (RTO) the best way of reducing emissions of Volatile organic pollutants

有机废气通过陶瓷蓄热载体器直接进入氧化系统，挥发性有机物质被氧化，生成无害的 H₂O 和 CO₂。氧化后气体通过陶瓷蓄热载体释放热能。这种能量回收和使用过程中进一步减少辅助燃料的需求和降低运营成本。

The process exhaust is introduced directly through the ceramic media into the oxidation system, the harmful compounds are generated into H₂O and CO₂ by oxidation. The heat is released when the hot cleaned exhaust goes out through the ceramic media. It will further reduce the auxiliary fuel consumption and operating costs.



SATTi RTO 特点 SATTi RTO Advantages

- 全时线上吹扫隔绝泄漏及交叉污染
- 可在线 / 停机逆洗清除蓄热砖的沉淀物
- 压力波动小于 20 Pa
- RTO 入口到烟囱的管道通畅不会因故障停机造成管道憋压的危险
- 可根据实际状况进行最大的余热回收（导热油换热、生成蒸汽等）
- 根据工况，VOC 破坏效率 99% 以上，热回收率 95% 以上
- Full-time on-line purge to avoid leakage and cross-contamination
- Available in back-out on-line/off-line to remove sediment from heat storage bricks
- Pressure fluctuation: less than 20 Pa
- Unobstructed and smooth pipeline from RTO entrance to chimney, enabling in-pipe pressure to be released in case of emergency
- Maximize heat recovery (via hot oil heat exchanger and steam boiler, etc) according to the operating condition
- VOC destruction efficiency is more than 99% and heat recovery efficiency is more than 95% in the actual applications

SATTi RTO 国内安装案例 SATTi RTO Experience



装置名称：转塔式 RTO 应用行业：石化
Petrochemical
RL type RTO



装置名称：转塔式 RTO 应用行业：覆铜板行业
CCL Manufacturing
RL type RTO



装置名称：转塔式 RTO 应用行业：化工 / 医药
Chemical/Pharmaceutical
RL type RTO



装置名称：塔式 RTO 应用行业：汽车制造
Automotive Manufacturing
Tower type RTO



装置名称：塔式 RTO 应用行业：胶带行业
Tape Manufacturing
Tower type RTO



装置名称：塔式 RTO 应用行业：涂料 / 印刷
Painting/print
Tower type RTO

Adwest RTO 特点 Adwest RTO Feature

- 采用无焰天然气注入 (NGI) 技术, 操作中无氮氧化物排放
- 采用 NGI 技术, 初级热回收率达到 95%, 降低 RETOX RTO (蓄热式氧化设备) 的天然气使用率
- 采用 NGI 技术, 可以比燃烧器点火 RTO 节省 40-55% 的天然气消耗量
- 快速冷却或启动天然气炉头
- 低压降 / 低成本的 RTO 传热介质
- 简单, 零泄漏的提升阀流量控制, 挥发性有机物的去除效率达到 99%
- 在车间组装成 RTO 模块, 在现场可以实现快速安装
- 低高度, 底座支撑设计的 RTO 模块, 在地面即可实现维护
- 7 天 / 24 小时响应客户要求, 提供技术支持, 终身免费的遥测诊断服务
- 内部 RTO 和电控盘, 取得 UL/ CUL 认证
- Virtual NOx Free Operation with Flameless Natural Gas Injection (NGI)
- Lower RETOX RTO Gas Usage with 95% Primary Heat Recovery and NGI
- NGI Can Save 40-55% on the Volume of Gas Consumed Compared to Burner Fired RTOs
- Rapid Natural Gas Burner Cold and Warm Startups
- Low Pressure Drop/Low Cost RTO Heat Transfer Media
- Simple, Zero leakage Poppet Valve Flow Control Provides 99% VOC DRE
- Shop Assembled RTO Modules Provide Rapid Installation Schedules
- Low Profile, Skid Mounted RTO Modules-Easy Maintenance From Grade Level
- 24/7 Responsive Service Support with Free Lifetime Telemetry Service Diagnostics
- In-House RTO & Custom Control Panel UL/CUL Certified Shops



中国泰州制药厂 VOC 尾气处理
Taizhou China Pharmaceutical Industry Reference



8000 scfm RTO 处理食品加工尾气
8000 scfm RTO for Food Processing



5000 scfm RTO 处理太阳能电池板涂装尾气
5000 scfm RTO for Solar Panel Coating Facility



110,000 scfm RTO 处理汽车喷涂尾气
110,000 scfm RTO for Vehicle Spray



70,000 scfm RTO 处理铝铸造车间尾气
70,000 scfm RTO for Aluminum Foundry



RTO 处理乙醇干燥和生物燃料尾气
RTO for Ethanol Drying and Biofuels



40000 SCFM RTO 处理卤化挥发性有机化合物
40,000 scfm RTO with Acid Gas Scrubber for
Halogenated VOCs



25,000 scfm RTO 处理烟草加工尾气
25,000 scfm RTO for Tobacco
Processing

催化焚烧

Catalytic Thermal Oxidiza

催化焚烧处理技术 (CTO) 是指把有机废气预热到 200-300°C 之间, 在催化剂的帮助下使废气中的 VOCs 氧化分解成 CO_2 和 H_2O , 催化氧化焚烧炉出口的中高温气体经过热交换, 预热未处理的废气, 从而节省废气升温燃料消耗的处理技术。

Catalytic thermal oxidation technology (CTO) refers to the organic waste gas is preheated to 200-300 °C . with the catalyst, the VOCs is decomposed into CO_2 and H_2O . Through heat exchange between the inlet untreated exhaust and the hot cleaned outlet exhaust, the inlet air is preheated to save the fuel.



石化产业尾气的触媒焚烧器处理系统
CTO in Petrochemical Exhaust Treatment

优势 Advantage

- 净化效率高, 根据不同的处理成分可高达 99% 以上
- 采用新型板式或蜂窝状催化剂
- 低温催化, 能耗小费用低, 运行稳定更安全
- 系统结构紧凑, 占地面积小
- 停留时间长, 燃烧充分, 分解彻底
- 自动化控制程度高、维修方便
- the destruction efficiency is high up to 99%
- a new plate or honeycomb type catalyst
- catalysis at low temperature, low energy consumption and stable operation
- compact structure and limited foot space space
- Long retention time assure completed combustion and decomposing
- Easy maintenance

吸附浓缩原理

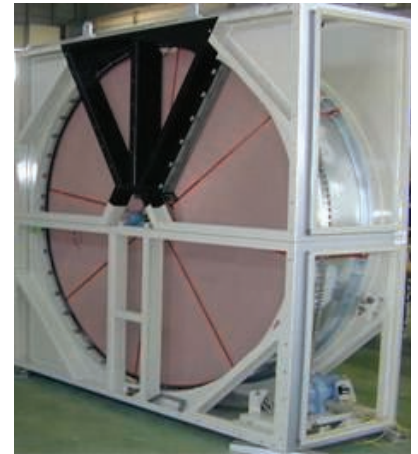
Principles of adsorption concentration

浓缩装置是将低浓度、大风量的废气浓缩到高浓度、小风量的废气。一个完整的浓缩系统由处理器和再生器组成。

VOCs 的浓缩通过吸附和脱附这两个连续的过程来实现。气体通过吸附载体时，VOCs 分子在吸附载体表面被捕集，从而使气体能达到大气排放标准。

A concentrator can condense low-concentration and high-volume off-gas to high-concentration and low-volume one. A complete concentrator system requires some sort of processor and recovery device.

Concentration of the VOCs is accomplished through a continuous adsorption and desorption process. Adsorption is the process by which the VOCs molecules present in the process exhaust air stream are collected and retained on the surface of the adsorbent media. This surface reaction takes place as the total volume of process exhaust is directed through the media, and the cleaned discharge can follow the standard of exhaust.



沸石转轮 (浓缩比为 1 : 20 的沸石浓缩转轮) Zeolite Runner

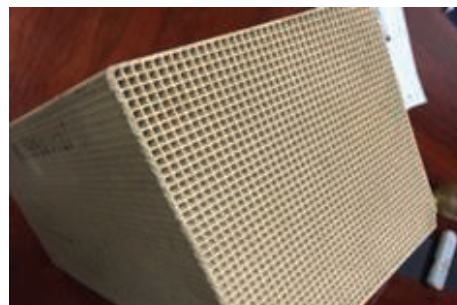
SATTi 旋转式浓缩系统的优点 Advantages of SATTi's rotary concentrator systems

- 低能耗
- 低运行成本
- 不产生 NOx 气体
- 使用寿命长
- 低压损
- 操作维护简便
- Low energy consumption
- Low operating cost
- No NOx created
- Long life time
- Low pressure drop across system
- Ease of operation and maintenance

蓄热砖

Ceramic Block

- 单位体积的传热面积大
- 蜂窝体壁薄，蓄热放热速度快
- 气体流动顺畅，其阻力损失较小；不易产生灰尘沉积堵塞
- 稳定性强
- The specific surface area is big
- The cell wall is quite thin, so it is quick to storage and release the heat in the ceramic blocks
- The gas flow is smooth, low pressure drop and reduce plug in ceramic block
- Stable performance



最先进的燃烧控制

State-Of-The-Art Combustion Controls

- 低 NOx 燃烧头
- 提高热能回收效率
- 可供选择的天然气及柴油喷射功能
 - 配有燃烧头隔断的 RTO 入口提高了天然气的热值
 - 无火焰运作时降低 NOx 生产量
 - 减少助燃空气，降低了燃烧消耗



- Low NOx burner
- Increasing heat recovery efficiency
- The function of NGI or Diesel injection is optional
 - Raise the heat value with burners off in RTO inlet
 - Reduced NOx emissions with flameless operation
 - Lowered fuel consumption by eliminating combustion air



风门

Damper

- 全自动 PLC 控制，按需配置 ON/OFF 和 4~20mA 比例控制，含反馈
- 气驱动，安全的单作用气缸，在异动情况下使系统回归安装状态
- 配置单独手轮，在任何控制元件异常损坏时，可手动操作
- 高温风门配置合金钢阀板，陶瓷玻璃纤维内保温，使用温度达到 990°C，耐温 1260°C



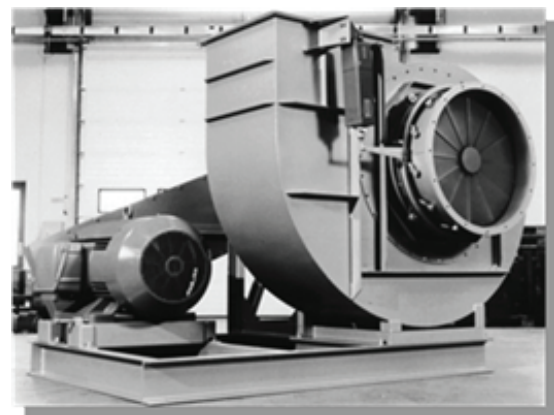
- Fully-automatic PLC control, ON / OFF or 4 ~ 20mA proportional control, with feedback is chosen by process
- Pneumatic actuator drive with safe single-acting cylinder, available to restore system to installation status in case of any emergency.
- Equipped with independent hand wheel, allowing manual operation in case of any abnormal damage on control parts
- High temperature damper is equipped with alloy steel valve plate, ceramic fiber insulation, the maximum operating temperature is up to 990°C , and the resistance temperature is 1260 °C



风机

Positive draft fan

- 配备高效马达，厂家测试合格
- 标准化风机装配
 - 减少风机体积及用电成本
 - 增加风机实用性
- 压力容积控制器不受 RTO 出口处温度的影响
- RL 标准变频驱动 (VFD) 提供
 - 任何的流量下运转成本低
 - 在启动时低电流流入
- Unitized, factory-tested fans with high-efficiency motors
- Standard forced draft fan arrangement
 - Reduces fan size and electrical costs
 - add the utility of the draft fan
- Pressure volume controller is unaffected by typical temperature swing at RTO outlet
- VFD is the standard design of RL
 - Low operating coats at any flow
 - Low current in-rush on strats



希柯集团其他产品

CECO Product Line

大气污染控制产品和方案

Air Pollution Control Products & Solutions

希柯可为收集和有毒排放物，烟雾，挥发性有机化合物和臭气的客户，提供种类丰富的产物回收和大气污染控制解决方案，具体包括洗涤器，布袋除尘器，氧化装置，旋风分离器，隔板，气体吸收器和工业通风设备。

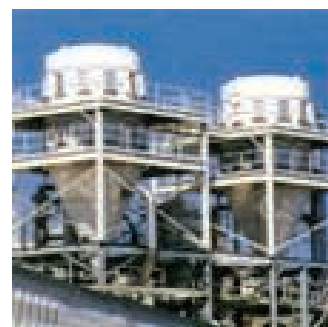
CECO Environmental offers a broad range of product recovery and air pollution control solutions for the collection and treatment of toxic emissions, fumes, VOC's, and odors including scrubbers, fabric filters, oxidizers, cyclones, separators, gas absorbers and industrial ventilation.



湿式洗涤塔
water scrubber



文丘里洗涤塔
Venturi Scrubber



布袋除尘器
high-pressure dust collector

能源产品和方案

Energy Products & Solutions

希柯为电力和石化工业客户提供种类繁多的定制化解决方案，包括废气和分流挡板门，非金属膨胀节，天然气涡轮排气系统，以及消声器和除尘器设备等等。

CECO Environmental offers a broad range of effective customized solutions for the power and petrochemical industry including flue gas and diverter dampers, non-metallic expansion joints, natural gas turbine exhaust systems, ball mill systems, and silencer and precipitator devices.



挡板门
Damper



燃气轮机排气系统和消音设备
Gas Turbine Exhausting System & Silencer

流体控制, 过滤产品和方案

Fluid Handling/Filtration Products & Solutions

希柯为客户提供种类丰富的流体处理 / 过滤产品及解决方案, 具体包括适用于腐蚀性、磨蚀性和高温液体的高品质离心泵, 气体、液体, 以及产物回收设备的过滤器, 以及技术领先的气体流动系统、排烟系统。

CECO Environmental offers a broad range of fluid handling/filtration products and solutions including high quality centrifugal pumps for corrosive, abrasive and high temperature liquids, filter products for air, liquid, and product recovery, and technologically advanced air movement and fume exhaust systems.



希柯除雾器
CECO Filter



美富亚过滤器
Mefiag Filter



泵
Pump

挥发性有机物 VOCs 控制系统应用领域

VOCs Control Systems

- 咖啡焙烧业
- 食品加工
- 谷物加工 (酒精)
- 汽车制造业
- 木材制造业
- 制药
- 化工业
- 石化产业
- 覆铜板
- 涂料业
- 罐装业
- 半导体
- 玻璃纤维
- Coffee Roasting
- Food Processing
- Corn Processing(Ethanol)
- Automotive
- Wood Processing
- Pharmaceutical
- Chemical Manufacturing
- Petrochemical
- CCL-Copper Coated Laminate
- Surface Finishing/Coating
- Can/Coil Coating
- Semiconductor
- Fiberglass
- 纤维制造
- 铸造业
- 油库
- 印刷
- 造纸业
- 墙纸
- 地板
- 固体废气物处理
- 废水处理
- 航空
- 造船
- PC 弹性板
- 复合材料及碳纤维
- Fiber Manufacturing
- Foundry
- Tank Farms
- Printing ,Flexography
- Pulp and Paper
- Wall paper
- Flooring
- Solid Waste Treatment
- Waste Water Treatment
- Aerospace
- Shipbuilding
- PC Board(flexible)
- Composites & Carbon Fiber

CECO ENVIRONMENTAL



总公司

希柯环保设备（上海）有限公司

地址：上海浦东新区泥城镇宏海路 6 号 201307

电话：+86-21-58248000

传真：+86-21-58249697

Head Office

CECO Environmental Shanghai CO., LTD a CECO Environmental Company

Add: No.6 Honghai Rd., Nicheng Town, Pudong New District, Shanghai 201307, P.R.C

Tel: +86-21-58248000

Fax: +86-21-58249697

超尊环保科技（上海）有限公司

地址：上海市吴中路 1065 号永腾大厦 605 室 201103

电话：+86-21-64466128 +86-21-54222502~3

传真：+86-21-64466108 +86-21-54222507

SAT Technology (Shanghai) Inc.

Add: Rm 605, Yongteng Mansion, NO.1065 Wuzhong Rd., Minhang District, Shanghai

Tel: +86-21-64466128 +86-21-54222502~3

Fax: +86-21-64466108 +86-21-54222507