

Activated Carbon Injection -

A Proven BAT

活性炭喷射 -

被验证的最佳替代技术

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卡博特公司介绍

卡博特公司：133年悠久而独特的历史



133年的悠久历史

- ◆ 由Godfrey Lowell Cabot创建于 1882年
- ◆ 从生产炭黑开始

1968年卡博特成为一家公开上市的公司 (NYSE:CBT)

- ◆ 2014年销售收入 \$36亿



覆盖广阔地域

- ◆ 1950年代: 进入欧洲；进入亚太
- ◆ 1960年代：进入南美
- ◆ 1980年代：进入中国

对粒子技术和表面处理技术拥有强大能力

- ◆ 超过 100名研发科学家和工程师

卡博特中国介绍

1988年，卡博特进入中国

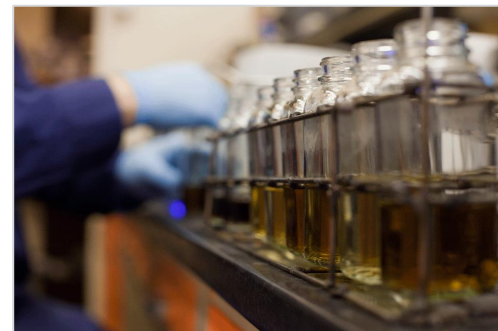
发展成为在中国非常成功的外资企业



卡博特诺蕊特活性炭介绍

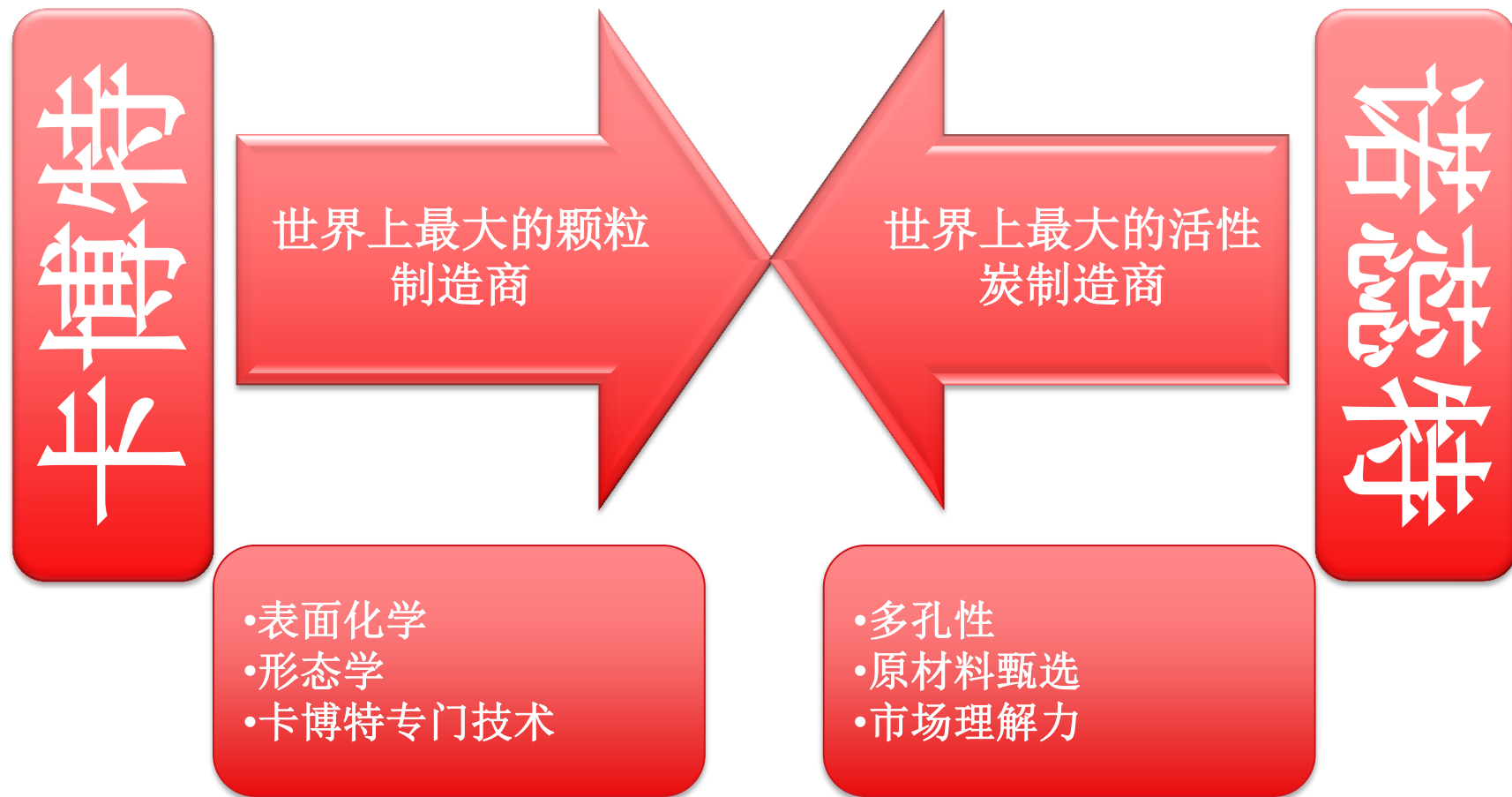
净化解决方案部门 - 卡博特诺蕊特活性炭

- ◆ 全球和北美最大的活性炭生产商
- ◆ 2012年由卡博特公司收购



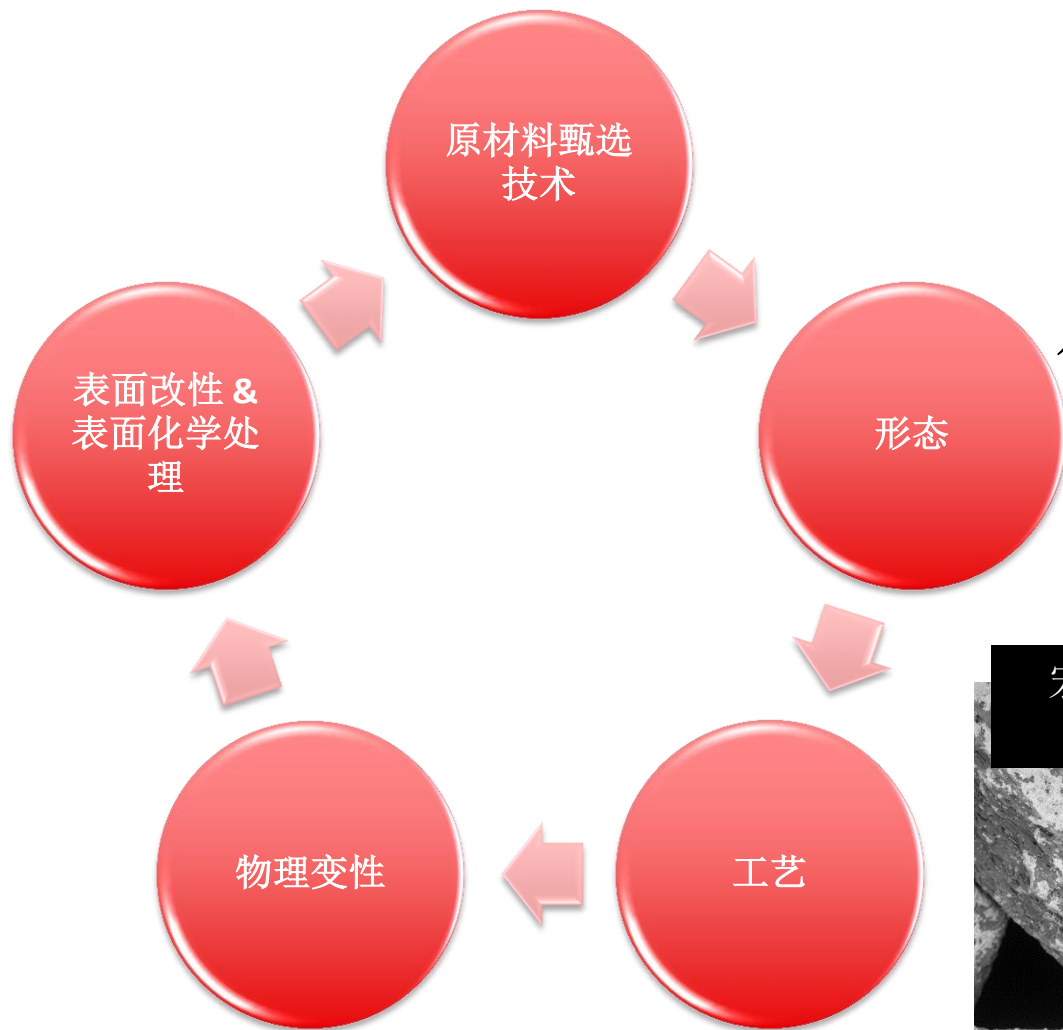
加快创新

2012年7月卡博特并购诺蕊特的强强联合



开发下一代产品

按下开关、开始前进



泥煤

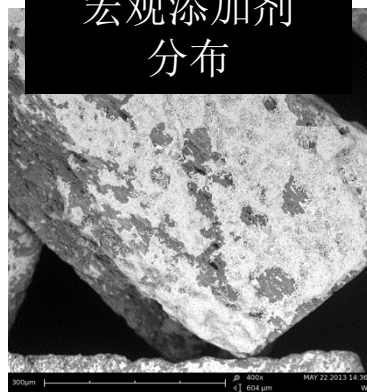


木制炭

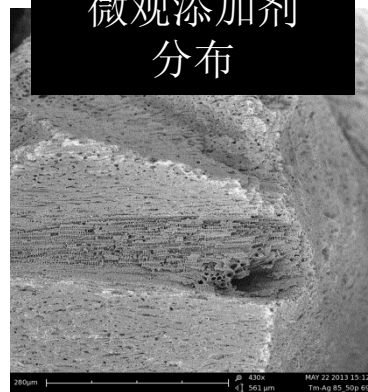
煤制炭

椰壳

宏观添加剂分布



微观添加剂分布

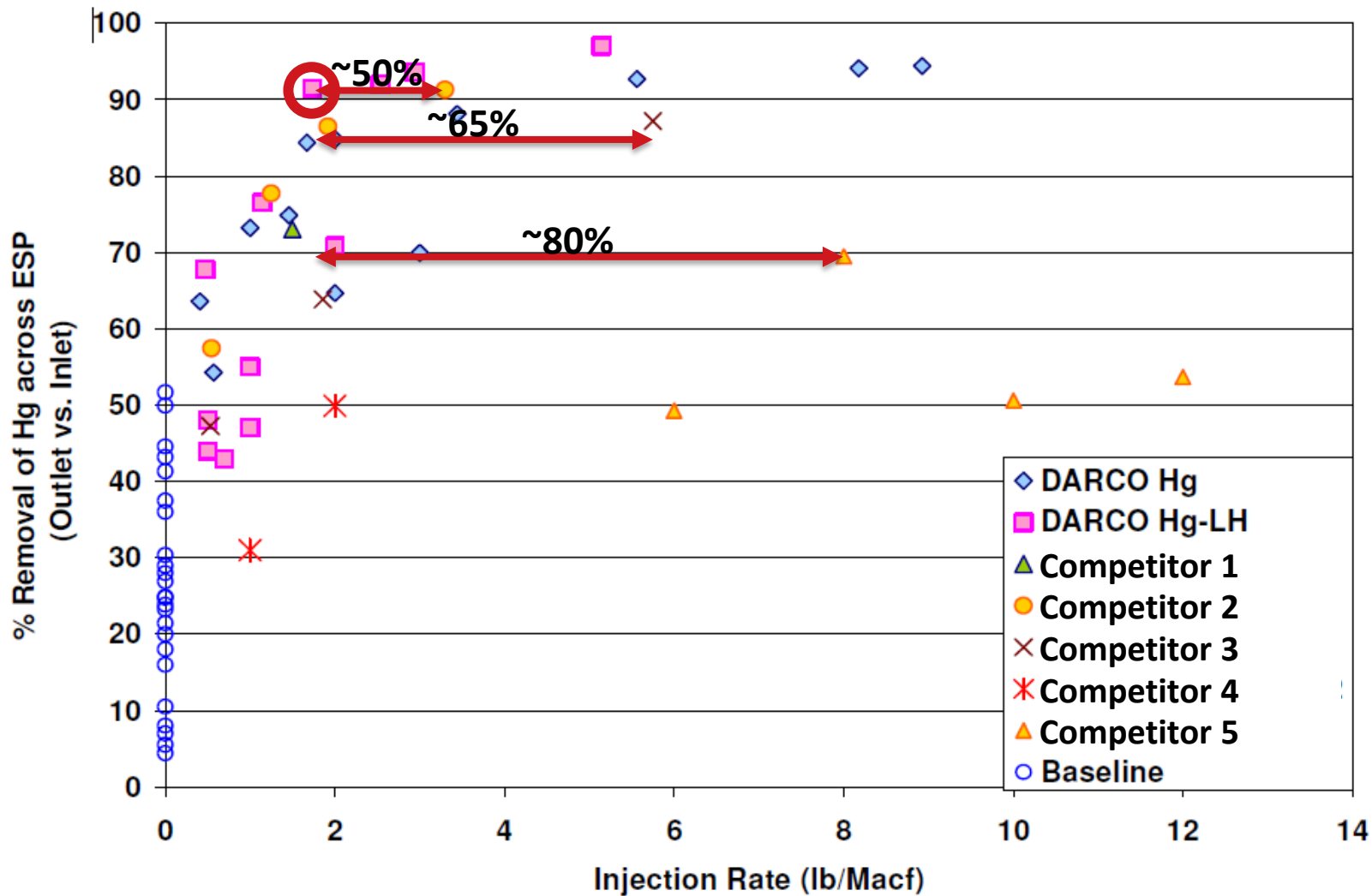


卡博特：
活性炭燃煤电厂脱汞的全球领导者

按照汞和空气污染标准（MATS），卡博特的DARCO® Hg-LH被认为除汞产品的标准

- ◆ 英国环境署规定的汞和空气污染标准要求每千BTU的汞排放小于1.2磅
 - ◆ 自2015年4月起生效
- ◆ 由美国环保署国家能源和技术实验室(NETL)发起，在超过20个发电厂进行活性炭用于除汞的测试
 - ◆ 测试了不同的活性炭、各种燃煤和不同的处理参数
- ◆ DARCO Hg-LH 处理能力比竞争对手的平均值高27%

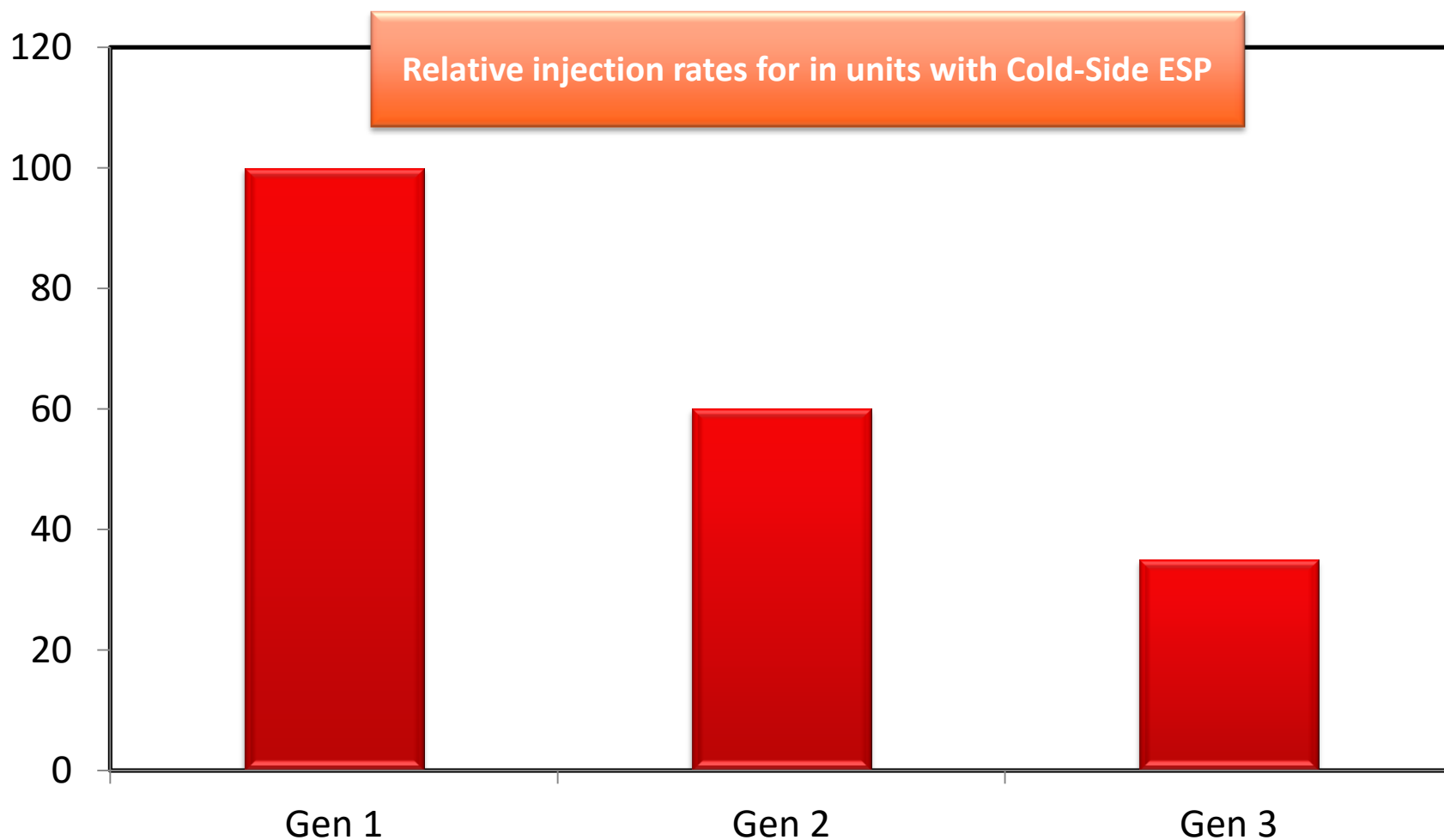
国家能源技术实验室测试所得的代表数据



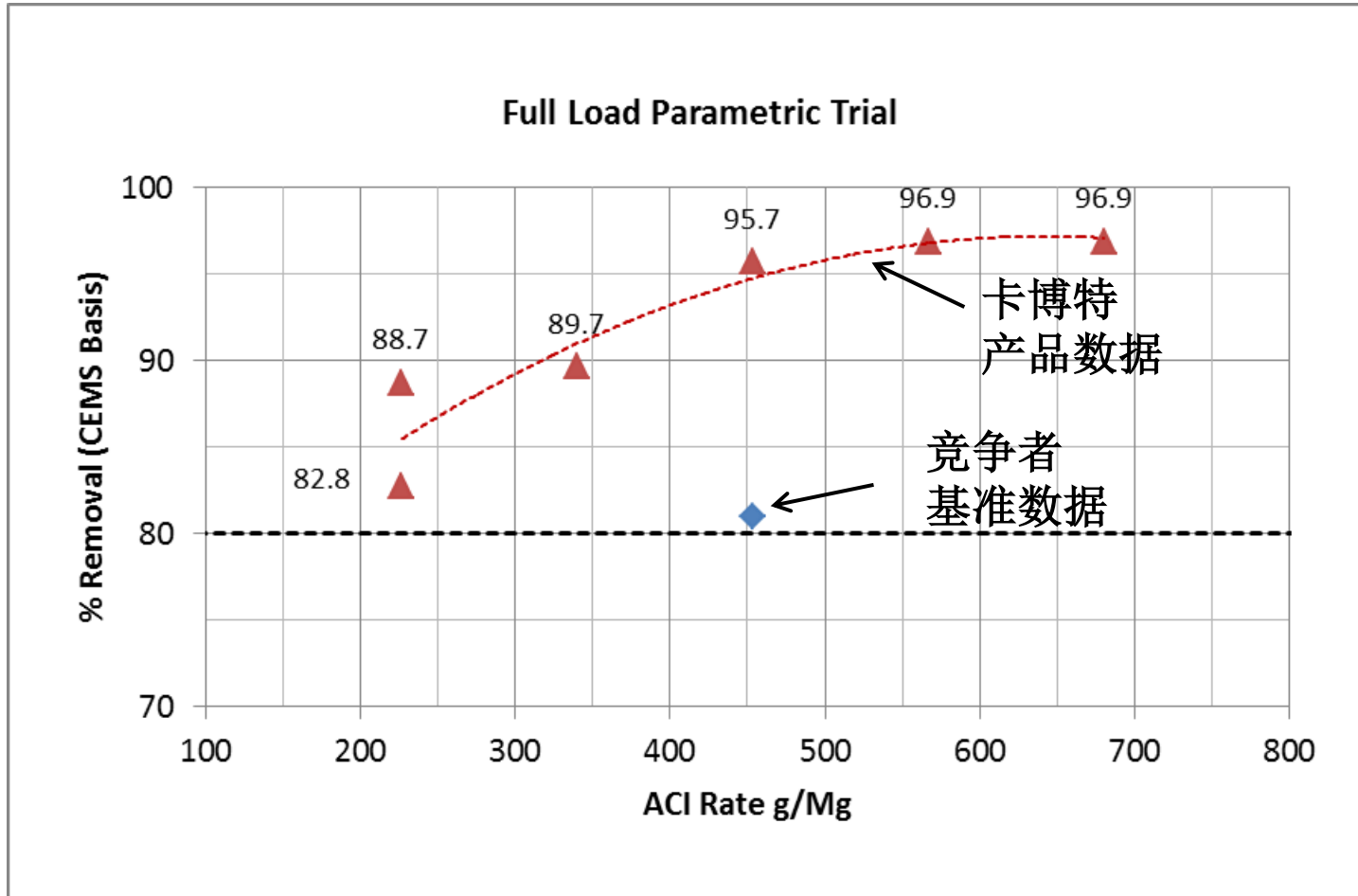
卡博特提供强大、完整的产品系列用于尾气脱汞

Product Innovation	Introduction Year	Application
DARCO® Hg	2005	Flue gas with high oxidized mercury content with more challenging configurations than the baseline non-brominated product, DARCO® Hg-H.
DARCO® Hg-LH	2005	Flue gas which lacks halogen content to convert elemental mercury to oxidized mercury. Treated with bromine to oxidize mercury.
DARCO® Hg-LH Extra	2011	Achieves greater than 90 percent mercury removal from flue gas at activated carbon injection rates up to 40 percent lower than our own industry benchmark product in sorbent injection plant trials. Enhanced patented process which includes bromine treatment to oxidize mercury.
DARCO® Hg-CC Extra	2012	High efficiency version of DARCO® Hg-CC activated carbon with improved mercury oxidation, lower RFI. Enhanced patented manufacturing process which includes bromine treatment to oxidize mercury.
DARCO® Hg-H	2014	Flue gas with high oxidized mercury content, typically due to the presences of a halogen, either native in the fuel source or added.
DARCO® Hg Extra	2015	Highly efficient non-brominated product for flue gas with high oxidized mercury content.
DARCO® Hg-LH Extra SP	2015	Next generation high efficiency brominated product for challenging configurations and short residence times. 20-50% more efficient than DARCO® Hg-LH Extra in full scale testing across multiple configurations and fuels.
DARCO® Hg-LH-Extra SR	2015	Specifically manufactured and brominated to improve mercury removal efficiency in applications with moderate to high SO3 present in the flue gas. Proven to reduce carbon consumption by over 50% from industry benchmark products.
DARCO® Hg-LH-Extra TR	2015	Specifically manufactured and brominated to improve mercury removal in applications in which trona or sodium bicarbonate are injected for the control of acid gas, SO2 or SO3 removal.

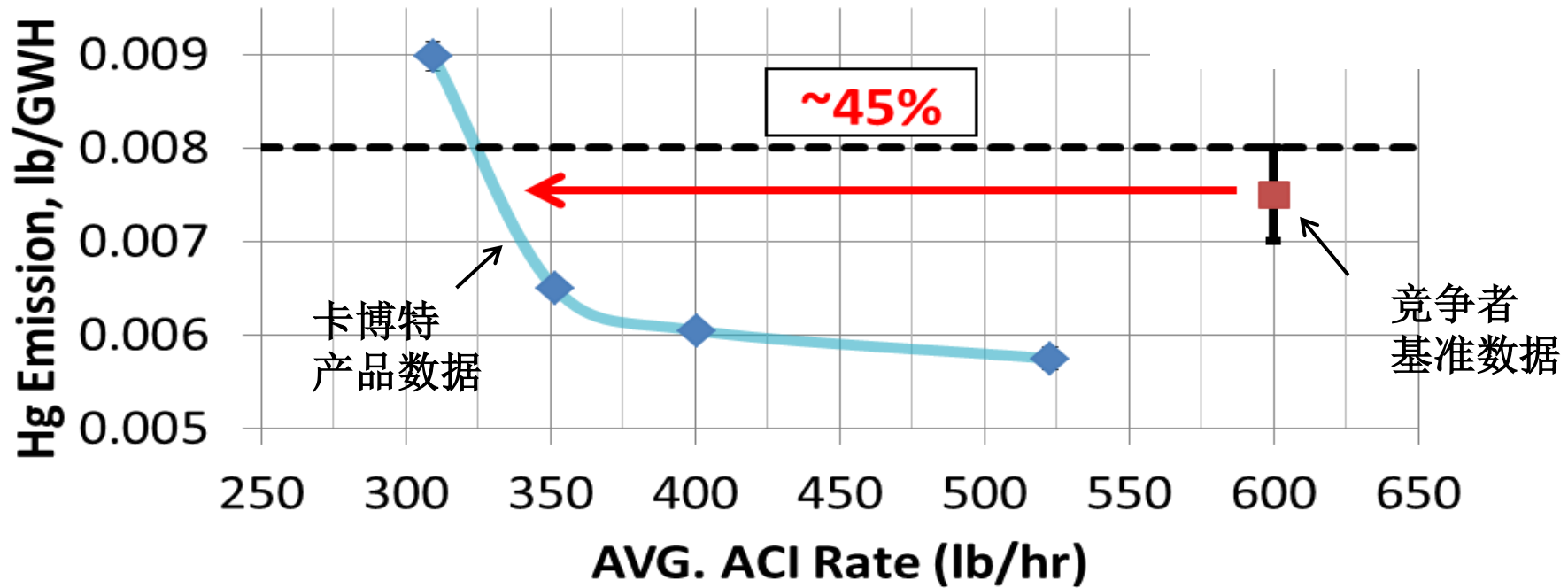
持续的新产品开发极大降低脱汞吸附剂的用量



卡博特高性能产品与业内其他主要产品的性能比较



卡博特高性能产品与业内其他主要产品的性能比较



可提供的服务

测试和现场服务

Staff人员

- ◆ Testing: 1 full time field service engineer, 2-3 support techs
测试：1为全职现场服务工程师，2-3位支持技术人员
- ◆ Systems: 4 field service engineers
系统：4位现场服务工程师

Capabilities能力

- ◆ Test design 测试设计
- ◆ Injection equipment – PM, Service, Operation
喷射设备 – 项目管理，服务，操作
- ◆ Method 30B trap testing
- ◆ Trap and data analysis – On site capabilities 现场数据分析
- ◆ Velocity traverse, Gas phase moisture

Lab Analytics实验室分析

- ◆ Marshall, TX; Billerica, MA 德克萨斯州马歇尔，马萨诸塞州比尔里卡
- ◆ Standard carbon properties, Ph, Cationic, Anionic, TGA, Elemental analysis, etc...
活性炭标准特性测试：酸碱度，阳离子，阴离子，TGA，元素分析，等



成功案例分享

燃煤电厂脱汞 – 案例1

Plant Characteristics 工厂基本情况

Boiler MW: 250

Flue gas flow rate acfm: 1.4M

Primary Fuel Source: Lignite

Fuel Treatment: Yes

SO3 Content: Less than 3 PPM

DSI Injection: None

Other Hg removal equipment: None

PM Control: Bag house

Plant's Mercury Emission History

工厂汞排放历史情况

Inlet Hg (lb/Tbtu): 10

Objective (lb/Tbtu): 1

Regulation (lb/Tbtu): 4

Outlet Hg (lb/Tbtu): 0.55

Cabot Solution 卡博特提供的解决方案

Product Used: DARCO Hg

Injection Equipment: PortaPAC

Injection Site: APH Outlet

Injection Rate (lb/mmacf): 1.4

Injection Temp (C): 177

Result 实施结果

Removal Rate: 95%

Projected Injection Rate lb/hour: 168

Plant Goal Achieved: Yes

燃煤电厂脱汞 – 案例2

Plant Characteristics 工厂基本情况

Boiler MW: 860

Flue gas flow rate acfm: 4.3M

Primary Fuel Source: Lignite/Sub-bituminous Blend

Fuel Treatment: Yes

SO3 Content: Less than 3 PPM

DSI Injection: None

Other Hg removal equipment: Wet FGD

PM Control: CS-ESP

Plant's Mercury Emission History 工厂汞排放历史情况

Inlet Hg (lb/Tbtu): 15.6

Objective (lb/Tbtu): 4

Regulation (lb/Tbtu): 4

Outlet Hg (lb/Tbtu): 0.8

Cabot Solution 卡博特提供的解决方案

Product Used: DARCO Hg

Injection Equipment: PortaPAC

Injection Site: APH Outlet

Injection Rate (lb/mmacf): 4.05

Injection Temp (C): 160

Result 实施结果

Removal Rate: 95%

Projected Injection Rate lb/hour: 450

Plant Goal Achieved: Yes

燃煤电厂脱汞 – 案例3

Plant Characteristics 工厂基本情况

Boiler MW: 350

Flue gas flow rate acfm: 1.6M

Primary Fuel Source: Sub-Bituminous

Fuel Treatment: Yes

SO3 Content: Less than 3 PPM

DSI Injection: None

Other Hg removal equipment: None

PM Control: CS-ESP

Plant's Mercury Emission History

工厂汞排放历史情况

Inlet Hg (lb/Tbtu): 3.7

Objective (lb/Tbtu): 0.74

Regulation (lb/Tbtu): 1.2

Outlet Hg (lb/Tbtu): 0.469

Cabot Solution 卡博特提供的解决方案

Product Used: DARCO Hg LH Extra

Injection Equipment: PortaPAC

Injection Site: APH Inlet

Injection Rate (lb/mmacf): 4

Injection Temp (C): 371

Result 实施结果

Removal Rate: 87%

Projected Injection Rate lb/hour: 228

Plant Goal Achieved: Yes

感谢您

Thank you

For Further Information Please Contact

Content 演讲内容

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