2019年IP投资集团全球深科技论坛

2019年10月
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石墨烯：涂料技术变革

对照组 石墨烯涂料

典型结果：经过3,000小时盐雾试验
石墨烯：令人瞩目的性能

- 2004年在英国曼彻斯特大学分离而成
- 2010年获得诺贝尔奖

如何最大化利用这种可能是21世纪最具颠覆性的材料

- 机械性能：强度比钢高出100多倍，硬度大于钻石
- 电气性能：导电性比铜高60%
- 热力性能：导热系数是铝的5倍
- 润滑性能：表面剪切率极低
- 抗渗性能：对氦气可实现气密性
- 透明：光学透过性约为98%
所有石墨烯公司共同面对的挑战：如何释放潜力

• 令AGM脱颖而出的差异化因素：

• 独特卖点：AGM通过自下而上的专利工艺，制造高规格石墨烯
  • 独特工艺技术用于制造石墨烯纳米片

• 独特卖点：AGM获得专利的分散体化学：实现成功使用的关键促成因素
  • 契合应用的一系列化学工艺
  • 绿色环保的解决方案
  • 符合最终用途的优化分散技术
  • 延长添加剂的使用期限
  • 便于运输
AGM独特卖点

所有石墨烯公司共同面对的挑战：如何释放潜力

• 令AGM脱颖而出的差异化因素：

• 独特卖点：AGM的应用技术：明确理解最终用途的需求及其如何实现
  • 与最终客户深入互动
  • 了解目的与需求
  • 定制解决方案：针对最终用途

• 独特卖点：AGM的独家工艺协助轻松使用石墨烯
  • 庞大的数据支持诉求
  • 提供教学与知识，协助客户
  • 为使用纳米材料提供法规指导

• 独特卖点：与AGM携手合作，释放石墨烯用途：
  • 涂料
  • 复合材料
  • 印刷
  • 粘合剂
石墨烯的巨大潜力

• 当前早期应用
  • 涂料
  • 复合材料
  • 弹性体
  • 高分子聚合物
  • 油墨
  • 纺织品
  • 电池研发

• 未来潜力
  • 生物医学
  • 混凝土与建筑工程
  • 导电技术
  • 消费电子
  • 电池平台技术
  • 工程聚合物技术
  • 过滤
  • 润滑剂

• 关键挑战：如何将这种材料投入应用？

• 各方预测，2021年石墨烯粉末市场的规模约为2亿美元，并且可达到较高的年复合增长率（CAGR）
潜在市场应用：涂料

- 全球涂料市场规模约为1500亿美元
- 中国市场规模约为600亿美元
- 35-40%的涂料与涂层制造用于对工业品进行保护或表面处理，分类为“产品处理”（HIS Markit）
- 需要大量制造商参与
- 焦点在于防腐底漆
- 特种底漆市场的价值可能高达70亿美元

石墨烯代表庞大的市场商机

资料来源：《欧洲涂料》
因腐蚀而造成的损失

对于能够更完善对抗腐蚀的涂料存在明确需求，而AGM石墨烯解决方案恰好能满足这一需求。
石墨烯：涂料领域的突破性成果

在最终涂层中加入重量比例0.5%的石墨烯A-GNP，可将性能提高5倍

<table>
<thead>
<tr>
<th>Control</th>
<th>Genable® 3000 Series</th>
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<td>900 hours</td>
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AGM技术是实现性能成功的关键
涂料解决方案示例

石墨烯用于阻隔性能与防腐

缓蚀

延长资产寿命

环保解决方案

独树一帜的防腐性能

延长涂层寿命

降低挥发性有机物（VOC）与有毒物质

增强腐蚀防止

降低维护成本

水基技术
商业客户：涂料市场

James Briggs

Applied Nano Systems

HMG

Alltimes Coatings

Genable®

航空航天业
商业客户：复合材料

复合材料，粘合剂，弹性体

印刷平台技术

客户：
F1赛车与汽车行业、
世纪钓鱼竿公司、航空航天工装公司
客户：空中客车防务及航天公司、Puraglobe润滑剂公司
中国市场机遇

中国

市场

• 石墨烯技术势头强劲
• 适用于广泛应用
• 有机会分享AGM的经验

专业技能

• 中国具备石墨烯材料
• 应用专业技术成为关键差异化因素
• 分享AGM赋能技术

知识产权

• 稳固的知识产权基础
• 创新模式
• 致力于产品开发

战略

• 通过合资企业，实现合作机会
• 共同促进业务增长
• 中国的石墨烯 + AGM专知 = 长期强势增长
谢谢关注