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The ASIA Miner
Asia Pacific's bi-lingual Resource Industry Magazine 亚太双语资源产业杂志
Volume 7 - Third edition May-June, 2010 Industry technical information 矿业技术信息

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Xstrata Technology's new generation in robotic stripping

XSTRATA Technology (XT) has released its new proprietary robotic stripping technology to the copper refining industry.

Developed by XT's Tankhouse Technology in Townsville, the technology uses a revolutionary stripping tool combined with robotics to provide a new generation in copper stripping.

The technology complements the successful Isa Process 2000 copper winning and refining technology package, with the new stripping device improving the efficiency of the copper stripping operation while reducing the damage to cathode plates. It can be used for low or high capacity stripping duties and is fully automated.

Tankhouse Technology engineering and manufacturing manager Ola Eriksson says the new stripping process has been in the development phase for more than 3 years before a prototype was built, which has been in operation for more than 6 months.

He said one of the biggest operational issues facing copper refineries is the loss of power that sometimes occurs, and the effects this has on copper growth on the cathode plate, resulting in irregular 'laminated' copper deposits, which can make it more difficult to separate the deposits during stripping.

The advancements of robotic technology has allowed the design of a simple multi-movement stripping mechanisms that can easily and efficiently strip the harder to break deposits that sometimes occur, while at the same time reducing the wear on the cathode plate.

The key to the new development is the stripping function, previously undertaken by mechanized down-enders, which is now performed by robots designed with a wedge tool at the end of the robotic arm. The wedge tool has been designed to slide between the released copper deposit and the mother blank, which prevents any scratching of the stainless steel mother plate, and then 'down ends' the copper to produce individual sheets of copper.

Greatly improved splitting and separation is achieved due to the wedge tool design and the flexibility of the robots, which results in minimal deformation to the individual copper deposits, even where lamination has occurred.

The use of robot technology is not new to Xstrata Technology. The Kidd Process introduced robotics to copper tankhouses in 2003, where the machines were well proven and demonstrated high reliability and very good operational flexibility in handling copper sheets and cathodes.

Taking this technology a step further, Tankhouse Technology engineers have used their extensive experience of Isa and Kidd Process, as well the expertise of the robot suppliers, to design and build a robust and versatile system for stripping copper. Building a prototype using full scale robotics and cathode plates has enabled a variety of forms of copper cathode that could be expected in a tankhouse to be tested, as well as test the reliability of the robotics.

Xstrata Technology's new robotic stripping technology which has been designed for use in the copper refining industry.

Ola Eriksson says robotic stripping will certainly improve the copper refining industry. "We see a lot of damage occurring to cathode plates due to poor stripping practices in the past, and if we can eliminate this, we have the opportunity to reduce cost and increase availability in the refineries.

"Bringing together robotics and a well designed stripping tool will certainly improve stripping operations. We have seen the prototype successfully strip all sorts of cathode and operate reliably and effortlessly – we think we have a great solution to an age old problem."

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斯特拉塔科技公司新型机器人剥片技术

斯特拉塔科技公司（Xstrata Technology，简称"XT"）于近日发布了用于铜冶炼领域的最新专利机器人剥片技术。

该技术由斯特拉塔下属位于Townsville 的Tankhouse科技公司研发，采用创新性的剥片工具，辅助以机器人技术，开创了铜剥片工艺的新时代。

该技术是对已获巨大成功的艾萨2000铜电积-冶炼技术的补充，采用新型剥片设备可提高剥片操作的效率，且减少对阴极板的损伤。广泛适用于大小生产负荷，并完全实现了自动化.

Tankhouse科技公司工程制造部经理Ola Eriksson说在样机投入制造之前，该新型剥片体系的开发耗时三年，而样机试运行也已进行了半年以上。

他说铜冶炼厂面临的重大操作问题之一是有时发生的断电，这会对阴极板上铜金属附着造成不良影响，导致金属发生不规则的分层沉积，进而增大剥片时的难度。

此项机器人技术的优势在于引入了往复运动式剥片设计，能够有效地将产生出的不规则沉积进行强制剥离，同时减少对阴极板的损耗。

设计的关键之处在于剥片的机制，此前常规手段采用的是机械化翻铲，而今是由机器人完成，在机械臂末端设有一个楔形工具，可在已分离出来的电解铜和母板间来回滑动，避免了对不锈钢阴极板的划擦，然后再把电解铜"铲"起来，剥片出单块阴极铜。

正是由于楔形工具的设计和机器人的灵活性使得分割和剥片效果得到显著提升，从而使单块阴极铜的变形也降到了最低限度，即使发生分层金属沉积也不例外。

采用机器人技术对于斯特拉塔科技公司来说并不是头一次。2003年的Kidd工艺将机器人科技引入了铜电积车间，后被证实处理阳极板和阴极铜时具有很高的可靠性和操作灵活性。

为了将此技术往前再推进一步，Tankhouse科技公司的工程师们利用其在艾萨炉和Kidd工艺方面的丰富经验，借助机器人技术供应商的专业技能，设计并开发更强大、使用范围更广的剥片系统。采用商业化生产全规模机器人科技和阴极板构筑的系统可对可能出现在电积车间中不同形式的阴极铜进行测试，并能验证机器人的可靠性和稳定性。

Ola Eriksson认为新型机器人剥片技术毫无疑问将对铜冶炼业做出积极贡献。"过去我们经常看到糟糕的剥片操作对阴极板造成严重损伤，如果我们能消除这一弊端，将有机会降低成本和提高生产效率。"

"机器人技术和设计精良的剥片工具结合在一起一定能够改善剥片操作工艺。我们已经见证了样机成功地剥离出了各种各样的阴极板，其操作可靠，毫不费力。我们相信已为困扰业界已久的老问题找到了解决途径。"

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