

通过先进的沉淀控制来改善纸机的运作性

在净化纸机的作用下，
当产生70gsm的拷贝纸时，断纸减少了50%

在印度尼西亚的一台碱性细纸机，由于受到沉淀的影响，性能下降了，并导致了一系列相关的问题如频繁的断纸，降低了质量和产量并减少了利润。现场的工作人员尝试用大量的杀菌剂，频繁的白水排水和机器的清洗来克服沉淀的产生。但是，无论以上哪种方法都会令工厂产生很高的成本。

造纸系统对沉淀的积累提供了一个良好的条件。污染可能来源于许多不同的地方，其中包括清水，纤维和添加剂。这些无法在纸页上留着的物质会在系统中积聚及相互作用，从而对沉淀的产生有很高的可能性。

这样不断积聚的结果便是，沉淀会开始出现在机器上，有时也会出现在纸上。为了使纸机不断的运行，昂贵的和具有破裂性的煮沸清洗要经常进行，并且沉淀控制的成本会以令人吃惊的速率在增加。尽管在操作和控制纸机方面有所专长，但是纸厂内的员工们并不具备去解决循环性沉淀的方法。

步向成为洁净的纸机

工厂要达至较洁净系统，并带来改进了的运作性和纸页质量。工厂决定更全面的去审视整个操作并对生产过程进行深层次的分析。

对纸机器测量和对沉淀分析的结果，显示出一系列的问题所在，主要源于送浆系统，添加剂，损纸，及白水系统。亦对沉淀控制物质作出严格筛选。通过电脑的模拟，我们同时也发现，现在的杀菌剂剂量是经常性的低于有效范围。

对沉淀控制的一种新方式

通过多年在亚洲纸机生产线上对沉淀控制的研究，亚马逊明白到要解决这个问题，就要对问题的本质有一个综合的理解，同时也要对系统的器械性，操作性和化学反应性有一定深度的认识。

在2006年11月的中旬，一个全面了解沉淀控制的项目在印度尼西亚工厂里进行。我们对其的基础原理进行了综合的分析，其中强调了器械性，操作以及沉淀问题中的化学成分这一部分。

整个计划中最至关重要的因素涉及到执行亚马逊一种新的沉淀控件目，叫作AMOX。在符合工厂要求的前提下，这个新技术首先要通过11步生产程序并在那里得到评估。这样可以确保新技术和当前生产过程的兼容性。

对设备安装的评价和递送是一个很漫长的过程。在AMOX项目真正在纸机上运行时之前，整个过程将近要3个月的时间。

在区域技术团队的全力支持下，当地的团队通过运用AMOX项目，执行了一整套重新设计过的沉淀控制项目。除此之外，他们也执行了一个更为先进的控制策略。亦为系统的污染物，杀菌剂的活性度，机器的生产，纸页断裂以及添加剂的用量和作用建立一个常规的文件。

Improving PM runnability via advanced deposit control

**With a cleaner PM, sheet breaks
declined by 50 per cent when
producing 70gsm copier**

An alkaline fine paper machine in Indonesia was dragged down by deposit related problems that led to frequent sheet breaks, reduced quality and output, and reduced profits. Onsite personnel attempted to overcome the depositions outbreaks with heavy doses of biocides, frequent white water drains and machine wash-ups, all of which carried a high cost to the mill.

Paper making systems provide favourable conditions for the buildup of deposits.

Contamination may come from many different sources, including fresh water, fibres, and additives. The materials which are not retained on the sheet will accumulate in the system and interact each other, creating a high potential for depositions.

As a result of such accumulation, deposits can begin to appear on the machine and some times also on the paper. Costly and disruptive "boil-outs" are frequently required to keep the machines running, and the cost of deposit control can increase at a staggering rate. Though expert in operating and controlling the paper mill machinery, the paper mill's staff was not equipped to confront recurrent deposition.

Towards a cleaner machine

The mill set out to achieve a cleaner machine system, with improved runnability and sheet quality. It was decided to broadly review the entire operation and perform in-depth analyses of the production process.

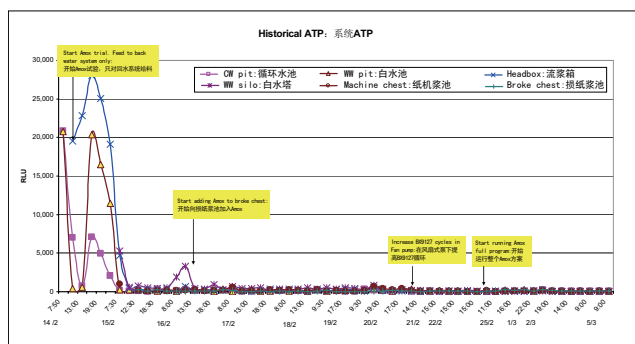
Machine survey and deposit analysis results exposed a sequence of problem areas, originating primarily in the approach, additives, broke, save all systems. Strict screening of

解决这类问题的多种方法途径为我们提供了新的控制标准，将沉淀产生的危害性降到了最低并有效的减少了大规模沉淀产生的可能性。

更好的表现，更好的收益性

到2007年的3月底，由于使用了AMOX项目来重新解决循环性的腐浆产生，工厂在这一方面整体表现上取得了很大的进步。在湿部，系统的污染物得到了有效的减少，并且腺苷-三磷酸盐的含量下降了。图表1。腺苷-三磷酸盐代表微生物为了新陈代谢活动需要的所消耗的能量。由于ATP的数量是和细胞的数量成比例的，也因此被用作量度样品中的生物量。

Improving Machine Runnability with an Advanced Deposit Control Program
采用先进的沉积物控制方案来提高纸机的运行性



AMOX有效的减少了系统中腺苷-三磷酸盐的含量
The Amox program has significantly reduced the system's Adenosine Tri-Phosphate levels

这样便带来了洁净纸机，在使用AMOX项目的17天之后，上方喷浆成形器上的窥镜的可视性是最好的证明，如图表2。这种在净化方面的改善也意味着沉淀，破洞和断纸的相对减少，同时也减少了总的纸机断纸。



在使用AMOX的17天之后，上方喷浆成形器窥镜的视野还是很清晰的
The sight glass of top former was kept clean even after running for 17 days with Amox

这种在微生物控制上的巨大改进导致了在机器运行上以及纸页质量上的很大改善。当在制造70gsm的普通纸时，断纸减少了50%，以及制造70gsm的高级用时，断纸减少了41%，如图表3。

这对于制造业来说也是一个十分重大的进步。当在制造70gsm不含磨木浆的纸时，纸机的日常产量增加了14.4%，从590吨增加到了675吨。

纸机净化方面的改善意味着沉淀，破洞和断纸的相对减少，同时也减少了总的纸机断纸
A cleaner PM means less deposit related holes and sheet breaks and a significant reduction in total machine sheet breaks

deposit control products was also conducted. Through computer modeling, it was also discovered that the current biocide dosages were regularly falling below effective targets ranges..

A new approach to deposit control

From years of experience in running deposit control programs on Asian paper machine lines, Amazon Papyrus Chemicals understands that solving mill problems requires a comprehensive understanding of the nature of the problems along with in depth knowledge of system's mechanical, operational and chemical interactions.

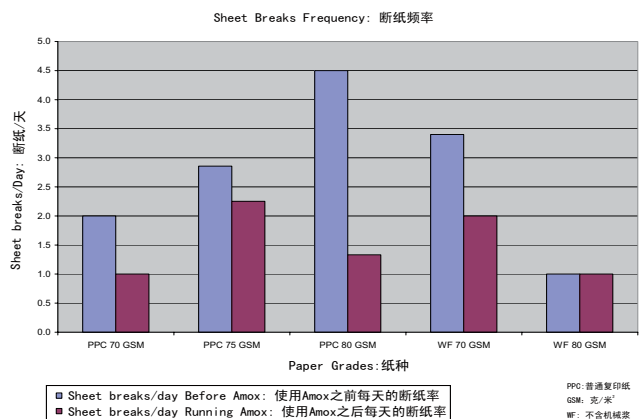
In mid November 2006, a thorough review of the deposit control program was conducted at the Indonesian mill. Fundamental to the approach was a comprehensive analysis which embraced the mechanical, operation, and chemical aspects of the deposition problem.

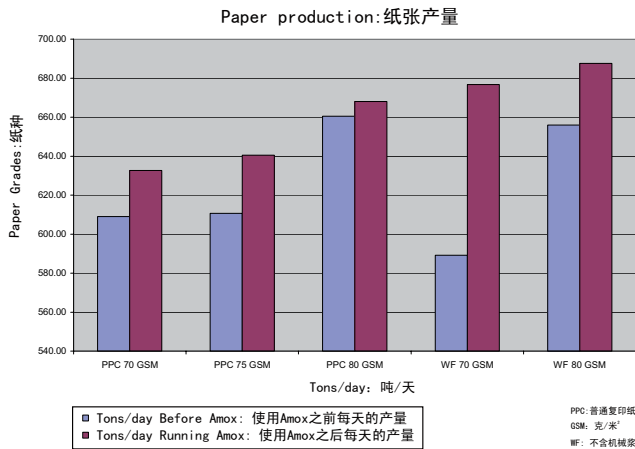
One crucial element of the plan involved the implementation of a new APC deposit control program called Amox. In line with mill regulations, the new technology had first-of-all to pass through an 11-step procedure whereby new technology is evaluated. This ensures the compatibility of the technology with the current process.

Evaluation, equipment installation and delivery are lengthy processes and it was nearly three months before the Amox program was actually running on the machine.

With the full support of the regional technical team, the local team implemented an entirely redesigned deposit control program by applying the Amox program. In addition, an advanced control strategy was implemented. It established a regular documentation of system contamination, biocide activity, machine production, sheet breaks, and additives usage & performance.

This multi-sided approach to the problem has established new control standards that minimized the risk of having deposit outbreaks and significantly reduced the possibility of larges scale deposit outbreaks.





对微生物的控制导致了生产率的大大提高
The improvement in microbiological control brought about a major improvement productivity

但是在生产80gsm的纸张时增加量相对的减小些，但仍然有4.6%，每天从655吨增加到685吨，见图表4。

这样的结果使得利润变得更加丰富了，并有效的帮助工厂在生产力上不断的提高。

FPR, % 一次留着率		% variation 变化
Before Amox 使用Amox之前	Running Amox 使用Amox之后	
85.63	86.39	1
86.93	87.80	1
86.50	86.93	1
86.71	87.10	0
89.00	88.03	-1

单程留着率并没有因为新技术的引进而削弱
First Pass Retention is not impaired by the new technology introduced at the mill

Cobb Size: Cobb施胶		% variation 变化
Before Amox 使用Amox之前	Running Amox 使用Amox之后	
21.86	20.55	-6
22.45	21.64	-4
22.70	22.67	0
24.08	23.60	-2
21.80	21.93	1

施胶作用得到了保留
Cobb size performance is maintained

纸机添加剂的兼容性
在改善了纸机运作性的同时，工厂的常规监察显示出这新技术

不会干扰到目前在纸机上使用的添加剂。单程留着率，单程灰分留着率以及施胶度的表现在使用最有效剂量中能够不断的保留，如图表5和图表6。

沉淀控制的新途径

AMOX是无毒的，容易操作的。当和工厂的次氯酸盐混合时，便会产生一种十分有效的沉淀控制剂，能够防止有机的和无机的沉淀积累。

在现代工艺的加料设备帮助，以及适当运用和监察策略的协助下，AMOX通过减少沉淀来加强纸机的运作性。同时也提高了生产率，降低了生产成本，也延长了每次清洗相隔的时间。

由Amazon Papyrus化学品公司技术市场经理Ezwar Roezzaman提供

Higher Performance, Higher Profitability

By the end of March 2007, having used the Amox program to resolve recurrent slime outbreaks, the mill saw a significant improvement in the overall performance indicators. Throughout the wet end, system contamination was reduced significantly and the Adenosine Tri-Phosphate level dropped, figure 1. ATP indicates the amount of energy used by organisms for their metabolism activities. Since the amount of ATP is often proportional to number of cells, it is also used as a measure of biological mass in a sample.

This has resulted in a cleaner machine, as demonstrated by the visibility of the sight glass on the top former after 17 days of the Amox regime, figure 2. This improvement in cleanliness means less deposit related holes and sheet breaks, reduced total machine sheet breaks.

This tremendous improvement in microbiological brought about a control major improvement in machine runnability as well as paper quality. Sheet breaks declined by 50% when making 70gsm, plain paper copier and by 41% when producing 70gsm fine paper, figure 3.

There was also a significant increase in productivity. When producing 70 gsm woodfree grades, the daily output of the PM increased increased by 14.4%, from 590 tons to 675 tonnes. While the increase was less in the heavier 80gsm qualities, it was still a considerable 4.6% - up from 655 tons to 685 tons a day, figure 4.

This translates into a significant improvement in profits and really helps mill to continue pushing to higher levels of productivity.

Compatibility with machine additives

In addition to improved machine runnability, the regular monitoring carried out by the mill showed that the new technology does not interfere with the performance of the additives currently used in the machine. First Pass Retention, First Pass Ash retention, and Cobb size performance are continuously maintained while utilizing the most cost effective dosages, figures 5 and 6.

A new approach to deposit control

Amox is non toxic as received; and, is easy to handle. When mixed with mill Hypochlorite, it releases an effective deposit control agent which will prevent the build up of inorganic and organic deposits.

With start-of-the-art feed equipment and the proper application and monitoring strategy, Amox improves paper machine efficiency by eliminating troublesome deposition. This leads to increased production rates, reduced manufacturing costs and extend time between shuts for cleaning. ■

By Ezwar Roezzaman.

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